

THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

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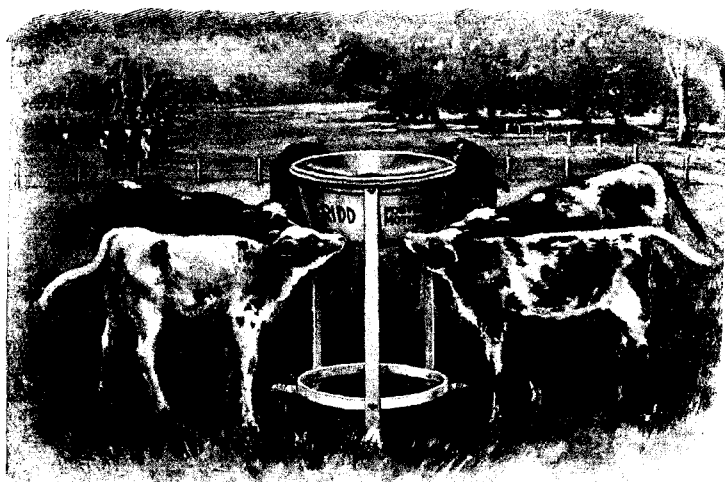
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Australian Wheat Harvesting Scheme

**: : The Necessity for : :
Government Intervention**



Issued by the Hon. the Minister
:: of Agriculture, Victoria, ::
Hon. F. W. HAGELTHORN, M.L.C.

By Authority:

ALBERT J. MULLETT, GOVERNMENT PRINTER, MELBOURNE.

AUSTRALIAN WHEAT . HARVESTING SCHEME.

*(Issued by the Hon. the Minister of Agriculture, Victoria, Hon. F. W.
Hagellhorn, M.L.C.)*

GOVERNMENT WHEAT SCHEME.

It is only natural that farmers should be keenly interested in the Government wheat marketing scheme. They want to know all about it. Some cannot understand why the Federal and State Governments should interfere at all. "Why not leave us alone?" they ask. They see wheat bringing a high price, higher than for many years; they have a record crop. "Why cannot the Government leave us alone? Wheat is worth 7s. a bushel in London; why should we, who suffered from a drought last year, not be allowed to take full advantage of our bumper harvest and high prices? We can sell our wheat without Government interference." Other farmers, while admitting that Government interference may be necessary, do not approve of the scheme. They consider the marketing charges too high; the amount advanced too small; the arrangements for control unsatisfactory. The object of this pamphlet is to explain the reason for Government interference, to show how the scheme will affect the farmer, and to answer the various criticisms directed against the scheme.

WHY THE GOVERNMENT HAVE STEPPED IN.

The reason why the Governments have stepped in is to save the farmers and the community generally from disaster. The circumstances not only justify the Government's action, but imperatively demand it. These are no ordinary times. The greatest war the world has ever seen is raging; the Empire is fighting for its life, and so are we. The war dominates everything—its effects are far-reaching, extraordinary, unexpected. The Federal and State Governments have interfered—not to prevent the farmer getting the benefit of high prices, but to save him from ruin and the country from chaos and disaster. The effects of the war manifest themselves in most unexpected ways. The war is the cause of the wheat problem. It is also the cause of high prices. If there were no war, farmers would have no difficulty in marketing their produce in the usual way. But if there were no war, prices would be much lower.

The war, which has made the Australian farmers' wheat much more valuable abroad, has also made the task of marketing the crop extremely difficult and costly. The farmer looks upon paddocks of waving wheat, ripening in the sun, stretching as far as the eye can see. It is a sight to fill the heart of man with great gladness; but it does not complete the picture. Before this bounteous harvest can be turned into money, it must be transported to the markets of the world. The farmer must face the position as it is, not as he would like it to be. It will not do for him to fix his eyes upon high prices in London and ignore the fact that these high prices mean little or nothing to him unless he can get his wheat to Europe. He must look at the whole position in exactly the same way as if he were 100 miles from a railway, with very bad roads thereto, the teamsters demanding exorbitant prices, and not enough teams in any case to cart half the produce in his district to market. What a mockery high prices would be to the farmer in such circumstances. But that is exactly the position to-day.

THE KEY OF THE SITUATION.

The key of the situation is freight. This war has, through one cause or another, put out of action—sunk, locked up, or diverted for war purposes—nearly half the world's shipping. Naturally ship-owners are able to obtain high freights. In normal years freights from Australia to the United Kingdom have ranged between 25s. and 35s. To-day they are quoted at 95s. to 110s.—that is to say, they have increased nearly 250 per cent. Put in other words, the cost of transporting a bushel of wheat from Australia to the United Kingdom is (including insurance) about 3s., or more than the farmer for many years actually received for his wheat. The present situation is abnormal—it is indeed unique. Methods suited to ordinary times are useless now. Means of dealing with the situation—adequate, equitable, practically and financially sound—had to be devised, and it is submitted that the Government scheme complies with these requirements.

GOVERNMENT CONTROL OF WHEAT.

FREIGHT SCHEME USELESS WITHOUT.

Without this scheme, the arrangements made by the Federal and State Governments, whereby the Commonwealth was made the only charterer of vessels for carrying the wheat crop to market, would be incomplete. Just as without Government control of freight, Government control of wheat would be of no avail. Both are essential to meet the extraordinary conditions created by the war. The salutary effects of the control of freight by the Federal Government are obvious. By this arrangement all competition for Australian wheat freights was eliminated. Instead of there being a number of competitors bidding

against one another, and so running freights up, there has been but one buyer. As a result, farmers are at this moment getting freight at from 10s. to 20s. a ton less than would otherwise have been the case. And, what is of much greater importance, they are getting freight which by no other means could they have got at any price.

HIGH PRICES FOR WHEAT MEAN NOTHING TO THE FARMER WITHOUT FREIGHT.

And this is the crux of the position. The great trouble is not so much that freights are high, but that freight is extremely difficult to obtain at any price. All would be well if it were possible to obtain sufficient freight to transport our wheat to market while high prices ruled. But this is the great problem. Never did we require so much freight—never was there less to be got. It is estimated that the amount of this season's wheat available for export will be somewhere between $2\frac{1}{2}$ million to 3 million tons. The greatest amount ever exported in any previous year was $1\frac{1}{2}$ million tons in 1913-14. In a perfectly normal year, when all the world's supply of shipping was available, the business of getting twice as much wheat to Europe as was ever previously handled would have been very difficult. It took six months—from January to June—to send away the 1913-14 crop with freights normal and all the world's shipping eagerly seeking employment. It would have taken from nine to twelve months to send twice as much. But with only half the world's shipping available, and every country in the world frantically endeavouring to secure it for itself, how long is it going to take to send away over twice the quantity of wheat? No one can tell.

WAR AND FREIGHT.

SUBMARINES—ADMIRALTY REQUISITIONS.

When this war is going to end no one can say, but in all human probability it will last another year at least. Every day it is playing havoc with the world's shipping. Every day submarines or mines of the enemy are sending good ships to the bottom of the sea. Every day the British Admiralty and the Allies are requisitioning more shipping. These facts are pregnant with great meaning. Even when freight is chartered, no one can say definitely—as in normal times—that so much freight will be available; it may be sunk; it may be requisitioned. The most one can say is that we hope that it will be available. But, apart from what is wanted for local consumption, who could buy wheat from the farmer under such circumstances? No private buyer could afford to do so. He must have the ship to fill before he will buy the wheat to fill

it with. It was this position which the Governments of the Commonwealth and the States felt themselves compelled to deal with in a bold, comprehensive, and practical way. They felt that only by a scheme behind which were all the resources of the Commonwealth and States could a general collapse of the wheat market be avoided. The private wheat-buying firms were prepared to buy only up to the amount of freight tonnage actually allotted to them. Only the Governments of Australia could shoulder the great responsibility of handling the entire crop and taking the risk of insufficient freight and a falling wheat market.

GOVERNMENT TAKES ALL THE RISK.

The risks the Government take in the freight and wheat market are very great. They involve many millions! No private firm or combination of firms would take such risks. The farmer is not asked to share these risks, and, on the other hand, he gets all its benefits, and these benefits are great. In the first place, he gets 2s. 6d. per bushel for his wheat delivered at the nearest railway station, which is equal to about 3s. f.o.b., Melbourne. Assuming the wheat crop to average 4s. 6d. f.o.b. throughout the season, that advance of 3s. is equal to two-thirds of the f.o.b. value. That advance is as large as the States can afford to risk, or as the banks could be asked to carry. And the farmer gets this just the same if the market falls so much that 3s. is equal to the actual f.o.b. price! He gets this 3s. at once, and gets the balance at the close of the season. The farmer thus will receive every penny his wheat realizes, less freight, insurance, and cost of handling. Under the scheme every farmer will get the same equitable treatment. The small farmer will not be left out in the cold; he will get as much for his wheat, and he will only pay as much for freight and handling, as the big farmer. If it were not for this scheme more than one-half of the farmers of Australia would have been ruined. Let the farmer look at the position quietly.

The Government have stepped in because this is a great national question. It is not only of vital importance to the farmer that he should get the advantage of high prices, but that he should get cash immediately in order to meet his liabilities. It is also vital to the welfare of Australia and the Empire that this great wheat crop should be profitably marketed.

THE POSITION OF THE FARMER BUT FOR THE GOVERNMENT SCHEME.

Wheat is 7s. a bushel in London now. What will it be in February? What will be the price in May? No one knows! It might not be 5s. Admittedly prices are abnormal. It looks as though they may keep up,

but no one can be certain of it. The difference between the value of the Australian wheat crop at 7s. a bushel and 5s. a bushel is £15,000,000. The difference between freights at 85s. and 120s. is £4,550,000. These fluctuations in the wheat and freight markets are not only possible, but probable. Who could buy, except at wrecked prices in such circumstances?

Is it not clear as noonday that in the face of all these facts a panic would have been inevitable? Farmers would have rushed their wheat in, falling over each other in the effort to realize on their wheat. What could wheat have been worth in such a case? Certainly not 4s. nett. It may be urged that private firms would have financed the farmers. Would they? To what extent, and upon what terms? No private firm or combination of private firms could be expected to shoulder a risk of having anything up to 2,000,000 tons of wheat thrown on their hands. For unless they could get the wheat to Europe while prices were high, they would lose millions. Who would pay the farmer cash for his wheat on the present basis of prices and remain out of his money for that period, taking the risk of a collapse of the market? No one would do it. Millers could have bought wheat at their own price. In plain words, but for this scheme the farmer would not have got a fair price for his wheat. He could not have got anything approaching it. No one but the Governments would have advanced 3s. per bushel on it.

But for the Government's scheme at the end of January, nine bushels out of every ten would have found no buyers; by the end of February not one bushel out of four could be sold; even by the end of May—if freight comes in as freely as for January, a most improbable event—not one-half the harvest could have found buyers. So that at the end of six months from now, if the Government had not stepped in, half the crops would have been unsold. The local market would have been demoralized, the benefits of high prices lost, the cash advance of 3s. impossible.

HANDLING CHARGES.

The charges payable by the Victorian Commission to agents are as follows:—

Total cost of receiving, weighing, sampling, stacking, trucking, being responsible for condition and quality of the wheat, storing, and delivering into ships' slings—3½d. per bushel.

When wheat is railed to millers—1½d. per bushel.

When wheat is received at mills from farmers' waggons—½d. per bushel.

These have been the subject of much criticism. It is contended that they are too high; but it will be remembered that in the first place the more important agents asked that 3½d. be given for the complete work of taking delivery at the stations and placing in the ships' slings. At a conference between the agent firms and farmers held in Melbourne, at which representatives from various agricultural interests were present, including the Farmers and Settlers' Association of New South Wales, the Chamber of Agriculture of Victoria, as well as other representative farmers, it was decided that the charges should be 3½d. Both parties signed the agreement, which was arrived at after very lengthy discussion and a comprehensive review of the whole situation. Subsequently the representatives of the Federal and State Governments had the charges reduced to 3½d.

REVIEW OF CHARGES.

It is contended in some quarters that even this charge of 3½d. is too high. The Central Board of Control (of which the Prime Minister is Chairman, and the Ministers of Agriculture for the wheat-producing States are members) has left all matters of detail to Mr. Hughes and Mr. Hagelthorn, and they have arranged that all charges shall from time to time be reviewed, and that the commissions will be subject to reduction if it is found, after a rigid examination, that they will afford more than a reasonable remuneration for the agents. Any reduction will operate from the commencement of the scheme, so that farmers who receive early advances will be in no way prejudiced thereby.

There are many conflicting estimates of what should be considered fair charges under present conditions. Experts themselves who are not interested in the scheme make widely differing estimates. Obviously the question of fair remuneration to agents largely depends on the length of the season over which shipping must be spread, the cost of labour, the number of rejects, and quite a number of varying factors which it is impossible at the inception of the season to estimate. Shippers, under normal conditions, have to make full allowance in their charges for all such contingencies, and the Central Board of Control has laid down the principle that the wheat must not be handled at exorbitant charges. Agents should be paid a fair remuneration for their services, and no more.

GAIN IN WEIGHT.

The whole of the gain in weight on shipments, which is an appreciable quantity, will be for the benefit of the pool, and therefore of the farmer. That gain in ordinary circumstances goes to the shipper.

FINANCE.

The money to be found for the financing of the scheme will amount to several millions. That money will be provided at the low rate of 5 per cent., a rate at which it is certain that few farmers or others can borrow to-day. No such rate could have been secured from any public or private institution, and even the Dominion of Canada is unable to borrow on such terms. But for the intervention of the Government, probably rates as high as 7 per cent. or 8 per cent. would have had to have been paid. It is not proposed to charge any interest directly on the advances obtained by farmers, but the interest will be charged as expenses on the proceeds of the whole crop, and deducted on the final adjustment of accounts.

Certificates will be forwarded to farmers showing the quantity of wheat they have delivered, and advances will be made on presentation of these certificates at the banks. Should a farmer refrain from taking the advance from the Government, his certificate will bear interest at the rate of 4 per cent. per annum. The certificates will be negotiable, and should it be possible for a farmer to secure a further advance from other sources, there is nothing to prevent his obtaining it. He may, either before or after he has availed himself of the Government advance, sell his certificate outright, and the announcing of sales to millers and others for internal consumption, as well as sales of cargoes from week to week, will enable farmers to have a very good idea of what their certificates are likely to be worth.

Should the marketing of wheat proceed satisfactorily, it is hoped that a further advance may be given to farmers about the end of June. Should the present prices continue, and shipping be available as anticipated, it should be possible to make a further advance of from 9d. to 1s. per bushel.

FARMERS SHAREHOLDERS IN THE POOL.

Under normal conditions, when a farmer sells his wheat and obtains his cheque from the buyer, he has no further interest in his wheat. Under this scheme he remains a shareholder until the final adjustment is made, and any indifferent wheat or badly-cleaned wheat will have the effect of reducing the fair average quality of Victorian wheat. It behoves every farmer who becomes a shareholder to see that his wheat is thoroughly cleaned and delivered in the best possible condition, so that the general interests may be best served. The whole scheme may be described as a co-operative realization of the harvest, with the State acting as manager, and the success of the scheme, to a large extent, depends on the whole-hearted co-operation of all the shareholders.

BOARDS OF CONTROL.

The Government has spared no pains to secure the best possible advice from the ablest men in Victoria. The Prime Minister and the Ministers for Agriculture of the four wheat-growing States will act as an Inter-State Board to control the shipping, marketing abroad, and fixing the price of wheat for Inter-State consumption, and controlling finance. They will be assisted in their work by a staff of experienced and trusted officers, as well as by the best experts procurable in the shipping and handling of grain. The control of the harvest in the State will be vested in the Minister for Agriculture supported by an Advisory Committee consisting of—

Hon. W. L. Baillieu, M.L.C.
 Hon. W. Hutchinson, M.L.A., Minister of Lands.
 Mr. Denison Miller, Governor of the Commonwealth Bank.
 Mr. O. M. Williams, Chairman of the Associated Banks.
 Dr. S. S. Cameron, Director of Agriculture.
 Mr. C. W. Wood, President, Chamber of Agriculture.
 Mr. E. H. Lascelles.
 Mr. J. Minifie.

This Committee, it is thought, is sufficiently representative to justify the farmers placing their fullest confidence in it, and—as in the case of the Inter-State Board—it will have the assistance of experts in all branches of its work. Messrs. J. Darling and Son, James Bell and Company, and Dalgety and Company Limited will be the experts advising them in regard to the handling of the wheat and the disposal of same. All are reputable firms with long experience in this class of work. Farmers, too, will be gratified to know that the services of Mr. J. Weldon Power have been secured as legal adviser. He is a gentleman who has perhaps been more prominently identified with agriculture and Agricultural Associations' work in Victoria than any other man.

A London Board, consisting of the High Commissioner and the Agents-General of the States interested, will supervise the sales of cargoes in London.

AGENTS TO HANDLE THE SCHEME.

The following agents have been appointed to handle the wheat in Victoria :—

Messrs. J. Darling and Son.
 Messrs. James Bell and Company.
 Messrs. L. Dreyfus and Company.
 Messrs. F. W. Prell and Company.

It has been announced that, as far as possible, existing organizations for handling the wheat will be disturbed as little as possible, but the

Government recognised that they would have to secure the very best services for doing this work effectively, and that the responsibility must not be placed in too many hands if that work were to be best done. Several smaller firms will no doubt complain that the largest firms have secured a monopoly, and that their business will suffer thereby, but the Government could not take any risks of ineffective working by having too many agents appointed. Some firms have been doing a great deal of work in past years in buying wheat in the country without doing much in shipping, whilst others have done a good deal of shipping without having organizations to purchase in the country. Both of these classes of operators have been eliminated, because the Government regarded it as essential that its agents should have the necessary organization for undertaking the complete work. The agents appointed, however, have undertaken to provide as far as possible for the employment of all those who can give effective service in the handling of Victoria's grain crop. The interests of some that have been doing work in the past must suffer. Merchants, for instance, who have been in the habit of storing grain for farmers, and earning commissions by the sale of wheat at auction, will find their incomes diminished this season. Many small brokers in the city will be unable to secure any commissions on the sales of wheat, because the Government will be the only seller. It is to be regretted that some sacrifice must be made by such firms or persons, but in the interests of the efficiency and economy of the scheme such sacrifices were unavoidable.

COMMENCEMENT OF THE SCHEME.

The scheme comes into operation on Wednesday, 1st December, and after that date no direct sales will be permitted. Farmers may take their grain direct to mills or railway stations, where it will be received in the usual way. They must satisfy themselves, as heretofore, in regard to the weight of their wheat, as well as to the deductions that may be made for anything less than fair average quality; that is to say, if they are dissatisfied with the miller's deduction from the f.a.q. of any of their wheat, they may have such wheat placed aside in the mill, and the dispute settled by an agent or inspector, who will be appointed for the purpose.

COMPLAINTS WILL ARISE.

It is impossible in carrying out a scheme of such magnitude to avoid complaints being made. Under normal conditions, when a farmer is delayed at a railway station with his team, owing to congestion of wheat to be delivered, he makes loud and long complaints. These complaints end at the railway station. Under this scheme many of these complaints will reach the Government. There will be other complaints in regard to settlement for wheat delivered. In some cases they will

be due to mistakes of the farmers themselves, and in others to the agents, and, perhaps, in some cases, to the Central Office staff in Melbourne; but it is hoped that, with the assistance of farmers, the scheme will, on the whole, work smoothly. Cause for complaints that must necessarily arise from time to time will be adjusted as quickly as possible. Any complaints that cannot be adjusted by agents should be addressed to the Secretary of the Victorian Wheat Commission, Broken Hill Chambers, Queen-street, Melbourne.

THE PRIME MINISTER.

It is but fair to let farmers know that the Prime Minister of the Commonwealth has thrown himself whole-heartedly into this scheme—the scheme outlined by the Victorian Government—and to him we are much indebted for both the quantity of shipping secured and the comparatively low prices at which it has been made available. He should also be thanked for the remarkably low price at which the money required to finance the scheme has been secured. His presence in London during the shipping and marketing of the bulk of the wheat will be of very great assistance to all interested in the scheme.

CONCLUSION.

Farmers and all concerned may rest satisfied that I, as chief executive officer in Victoria, and those associated with me, will leave nothing undone that is humanly possible to make the scheme successful and of benefit to the farmers and the people of Victoria. In a scheme such as has been launched for the first time—the biggest pool ever attempted in the Southern Hemisphere—difficulties will continuously crop up. We are all prepared to be subjected to adverse criticism from time to time, but we can only hope that the ability possessed by those who are in control, placed at the disposal of the farmers and people of Victoria, will result in the end in satisfying all concerned.

The scheme agreed upon, before being adopted, was subjected to most careful examination. Every provision has literally had to run the gauntlet of the keenest criticism of the best brains in the business and financial world. It is not claimed that it is perfect, but the Governments concerned boldly assert that it is a practicable scheme, adequate to meet the extraordinary circumstances by which we are faced, safeguarding the interests of the farmers and of the community generally, and resting upon an absolutely impregnable financial foundation.



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LONGERENONG AGRICULTURAL COLLEGE.

FARMERS' FIELD DAY.

THE MINISTER OF AGRICULTURE EXPOUNDS THE WHEAT MARKETING
SCHEME.

(Abridged from the *Wimmera Star*, 16th November, 1915.)

Longerenong Agricultural College was *en fête* last Saturday, when the second annual Farmers' Field Day was held in the wide demesne, under the auspices of the Horsham Agricultural Society. Upwards of 200 farmers from the Wimmera district, chaperoned by the students, visited the experimental field plots, prior to partaking of refreshments in the great hall, where speeches were delivered on the financing of the harvest by Mr. Hagelthorn and other members of the State Ministry.

Among the distinguished guests were the Hon. F. Hagelthorn, M.L.C. (Minister of Agriculture); Hon. W. L. Baillieu, M.L.C.; Mr. W. A. Adamson, M.L.C. (Minister of Public Works); Messrs. J. Gray, M.L.A.; R. Bloomfield Rees, M.L.C.; Sir John Forrest, P.C., G.C.M.G., M.H.R.; Mr. A. S. Rodgers, M.H.R.; Mr. James Menzies, M.L.A.

The visitors were met at the entrance to the experimental fields by Mr. A. E. V. Richardson, M.A., B.Sc., Superintendent of Agriculture, and Mr. A. C. Drevermann, Principal of the College.

The grounds never could have been seen under better conditions, nor could the crops have presented a more luxurious appearance than on Saturday. Everything that tillage and scientific application of

fertilizers, combined with a good growing season, could accomplish was in full evidence.

In the course of an address to the assembled farmers, Mr. A. E. V. Richardson, Agricultural Superintendent, stated that the Experimental Plots conducted at Longerenong are being worked in co-operation and co-ordination with similar work, of a more extensive character, on the State Experiment Farms at Werribee and Rutherglen. Werribee is the Central Research Farm, on which is taken the initiative in all experimental work; Longerenong College is used as an experimental centre for the Wimmera district; and the Rutherglen farm as an experimental centre for the north-east. One of the most important features of Longerenong is that it is used as a centre for the production of new varieties of wheat that are likely to be of service under Wimmera and Mallee conditions. The experiments at Longerenong were all started three years ago. They were established in the interest of farmers to demonstrate under experimental conditions the results that would accrue from treating the soil in different ways, with different manures, and with different varieties of wheat.

Mr. Richardson pointed out that there were 400 varieties of wheat under observation, obtained from all parts of Australia, Canada, United States, Russia, and even from our hated enemy, Germany. While the majority of these wheats are unsuitable for our climatic conditions, they are of considerable indirect value in improving by cross-breeding our local varieties. Several of the crosses promise to excel the common staple varieties in prolificacy at the present time. Some are prolific, but prone to rust; some rust-proof, but poor yielders. The aim of the Department at Longerenong is to produce heavy-yielding varieties that are relatively immune from fungoid pests, and this Mr. Richardson is not hopeless of obtaining. Some of his crosses already are remarkable for their encouraging promise. Federation appears to be the present standard of comparison, and was to be seen planted at every tenth row. The popularity of Federation with our farmers may be gauged from the fact that out of the 20,000 bags of seed wheat bought by the Government on the Minyip Station last year, 19,000 bags were found to consist of the Federation variety.

The main subdivisions of the work were the variety wheat tests, fertilizer trials, selected wheat plots, forage trials, and plots for the production of new crossbred wheats.

In the variety wheat section a number of new crossbred wheats were undergoing trial in competition with well known standard varieties, such as Federation, Yandilla King, and Dart's. Great interest was evidenced in a new crossbred wheat, namely, Indian F. x Federation, which stood out prominently from other crops by the extraordinary length and compactness of the heads. This plot gave promise of yielding several bushels more per acre than the best standard varieties.

In the fertilizer trials, fifteen different combinations of manures were being tested. These plots demonstrated the superiority of superphosphate over other phosphatic dressings. Some plots were treated with superphosphates at rates varying from 56 lbs. to 2 cwt. per acre; it was noticeable that the heavier dressing of phosphate gave a much more marked response than the lighter dressings. Other features of interest were the effect of lime in combination with superphosphate.

The application of lime in small quantities seemed to result in a decided improvement in the yield. Only when these plots are harvested will the full value of these differential applications of manures be apparent, and the net profit accruing from each application known.

In the forage section, attention was directed to the remarkable growth of dun peas. These were very heavily podded, and, besides being of considerable grazing value, would greatly ameliorate the fertility of the soil. An extraordinary heavy crop of rape was observed, 4 feet high.

A whole block was devoted to testing new crossbred varieties that had been evolved during the last four years. A number of these showed considerable promise. Among the outstanding types were the crosses of Indian F. x Federation and Bobs x Federation.

Other features of interest were the plots devoted to the testing of selected varieties of barley. Two years ago yields ranged from 60 to 80 bushels to the acre. These were secured from Oregon, Cape, and Squarehead barleys. Plots this year gave promise of almost equally heavy returns. Among the varieties tested are Cape, Oregon, Squarehead, Shorthcad, Pryor, Goldthorpe, Kinver, Golden Grain. Other tests of interest were the graded seed trials and rate of seeding tests. Federation seed at the rate of 30, 45, 60, 75, 90, and 120 lbs. per acre was sown in May and July, with the object of testing which is the most profitable rate of sowing per acre, when seeding is early or late respectively. Tests were also made to compare the relative value of seed from the harvester with first, second, and third grade seed from the grading machine. A series of half-acre plots, the produce of the selection plots of the previous season, were tested, with the object of providing bulk seed for the farm plots. The varieties under trial were Federation, Currawa, Major, College Eclipse, Viking, Bunyip, King's Early, and Hudson Purple Straw.

A demonstration of the cross-breeding was given by Mr. Richardson in the grounds. He showed how Indian F. was crossed on Federation. This was illustrated by blackboard diagrams, and by handing around dissected parts of the wheat flower.

He stated that the production of new varieties by cross-breeding was governed by laws, which were now well known. Specimen heads were gathered from the plots to show how various important characters in wheat, *e.g.*, shape and structure of the ear, were inherited in the first, second, and third year, and how a knowledge of the laws of inheritance enabled the breeder to rapidly fix new and desirable characters in wheat, and how to combine the qualities of two or more types of wheat into the one variety.

When the exceedingly interesting address of Mr. Richardson at the blackboard had concluded, a profitable hour was spent with him as guide wandering through the wheat and forage plots. When all that was possible to see within the limited time had been examined, the party entered their waiting motors and buggies and drove up to the hall, where the tables were laid, and students waited in attendance. Tea and comestibles having been disposed of, the more serious matter of speech-making started, and the attentive visitors listened with rapt attention to modes, methods, ways, and means of handling their wheat.

THE SPEECHES.

The Hon. F. Hagelthorn, M.L.C., Minister of Agriculture, after a few introductory remarks, said the question of marketing the Victorian harvest by the Government is one in which every one is interested. Farmers want to know how they are going to market their wheat, and how they are going to be paid for it. Some two or three months ago, in order to secure some unanimity of action, it was decided by the Victorian Government that a conference of Ministers of the four wheat-growing States should be called. I was asked by Mr. Hutchinson, the then Minister of Agriculture, to be present, and assist him, as far as possible, to evolve a scheme that would be satisfactory to the people of Victoria and the wheat producers of the four States. A number of schemes have been promulgated. My colleague, Mr. Rees, has submitted one, and is to be congratulated upon the keen insight he has taken in that which affects the financial province of the harvesting. (Hear, hear.) All these schemes were pondered over before going to the State Conference, but they seemed to fall far short of meeting the difficulty of satisfactorily marketing the crops. In our trouble we turned to a gentleman who has solved many difficulties, Mr. Baillieu. It is perhaps difficult to pick out what part of the scheme is his and what part is mine, and what part is due to the other Ministers who were on the conference. It is certainly difficult to apportion the proper share of the merit to each; but whatever he or I conceived, we came to the conclusion that a common scheme was necessary, and that having undertaken to do part of the work in harvesting the crop that the Government was compelled to "go the whole hog," and do it all. Mr. Baillieu, after conference with some of his colleagues, evolved a skeleton scheme, which was submitted to the conference, and practically adopted. Mr. Rees' scheme embraced the issue of negotiable scrip. The Government of New South Wales was prepared to make an advance of 2s. a bushel f.o.b., and South Australia had a somewhat similar scheme. New South Wales, under its scheme, would have had to appoint quite an army of men to take control of the wheat storage and enter into competition with existing organizations which had dealt with the storage of it in the past. The conditions were regarded as impossible, and the New South Wales scheme was withdrawn. South Australia proposed to advance 2s. a bushel on wheat stored by certain recognised private firms. The weakness of this proposition was that a farmer whose wheat was so stored would generally be left with his produce on his hands, as compared with the farmer who had not received a Government advance. The merchant would obviously ship away the wheat on which he had advanced his own money, and thus the unfortunate Government-aided farmer would always be left to the last, to take whatever low prices might be going at the time. Those farmers who received no Government advance would derive all the benefit from the pick of the markets, and the State Government would be blamed because its clients would be the worse off. A number of modifications of this scheme were suggested, and submitted to the conference, but they all came back, with the objection that we were short of shipping facilities; and, in order to deal fairly, it would be necessary to provide that each man should have an equal chance of getting his wheat away to obtain a fair price for it.

If certain merchants were allowed to get possession of ships, they would be able to deliver and sell at high prices, while those who could not get vessels would have to sell their wheat at absolutely wreck prices. It had been suggested that the Government should let things go on in the ordinary way, or provide the ships, and allow the merchant to do the rest. Well, Mr. Hughes, one of the keenest critics I ever met, thought it necessary to prevent any one merchant from receiving a higher bonus than another by giving him any particular ship, and, secondly, that the matter should be dealt with so that all wheat producers should obtain an average price. We then arrived at the present scheme, in which the principle is recognised that it is absolutely essential, in the interest of the farmers and the people, that all persons should get an equal opportunity to dispose of their wheat. If we were going to have things effectively done it was also essential that all the States should adopt the same policy. The Victorian Government will take complete control of all wheat grown within the State, and will truck to the seaboard, ship, and sell all wheat that leaves the country; and be the only sellers of wheat used for internal consumption. There will be only one source—the Government—from which millers will be able to obtain wheat. We expect to have 150,000,000 bushels of wheat, which at 4s. a bushel represents £30,000,000. Victoria will have at least one-third of that total, and we expect £12,000,000 for our wheat. It is a great sum of money, and one that few Government Departments have ever been called upon to handle; and if we had not taken the matter in hand the farmer would be compelled to sell his wheat at wreck prices; because in these abnormal times there will be a scarcity of shipping, and the wheat would be left on his hands, and he would have to struggle to realize at any price to meet his obligations. After consultation with Mr. Hughes, I made inquiry from the big merchants, and found that they had authority to sell at 3s. 6d. a bushel on the rails, and at Williamstown, at a time when the London parity was 4s. 6d. a bushel; so that we would have had to take a shilling below the value at that time. Under such conditions, of what use would be the wheat certificates proposed by Mr. Rees; they would prove "mere scraps of paper." Without assured means of shipment, who would buy? And without buyers, where would the farmer be? Had the few ships available been allotted to a few merchants these men would have made enormous fortunes at the expense of the community. We took pains to have the position proved. We asked the merchants, who are in the habit of buying wheat in normal years, if they would buy wheat from week to week and month to month. They, one and all, said, "We will not buy a single bushel of wheat more than we have bottoms to fill, and we must have these ships allotted to us." That means, we said to them, that except for the wheat sent away in these ships, wreck prices will have to be accepted. They answered, "No, because as there will be no buyers, there will be no sellers." But it is obvious that many farmers would have had to force wheat upon the market at a sacrifice in order to pay their back debts and keep going. Another difficulty which confronted us was that of getting any ships at all. The Admiralty was taking over all the spare ships possible, and had begun to cast eyes on Australian traders. Mr. Hughes, hearing that fourteen of our steam-ships would be required for transport of troops, cabled to the Admiralty, "We don't want to interfere with your

work, but we want you to understand that unless Australia can finance its wheat harvest it will have great difficulty in financing its part in this great war." The Admiralty replied by releasing the fourteen vessels, and promising to provide as many ships as could be spared to take away our wheat. To talk about private enterprise being able to do better than we can, assisted by the British Government, is to talk nonsense! There may be some who will say they do not want to be interfered with, and may want to hold over their wheat. If a number of men thought that way, it might be very difficult to get ships at all when they might want to ship away their wheat. In the common interest we want to see that wheat is shipped away as regularly as possible, and it may be necessary to take legal powers to take control of wheat within the State, in order that every one interested may get a fair and equitable price all round. Our proposition is to make an advance of 3s. a bushel f.o.b., and it will be gratifying for you to know that the present f.o.b. price of Australian wheat is 4s. 9d. per bushel. We feel that we run but little risk in making that advance of 3s., and the farmer will get the full residuum of what we realize. Should the wheat realize 4s. 9d. a bushel, there will be a dividend of 1s. 9d. payable on each bushel of wheat. This proposition is not the creation of a Socialistic Government, but of Mr. Baillieu and myself, two members of the Victorian Government. My interest is entirely the same as that of the farmers of this State, and Mr. Baillieu has great interest in wheat in the North Province, on the east side of me. Our interest is that of the farmers, and the interest of the farmers is that of the community. As I said, we have 150,000,000 bushels of wheat; and the bankers did not like this proposition of ours. They objected to it as Socialistic. We requested them to give us an alternative proposal. They could not, and did not. The alternative scheme would have resulted in our wheat fetching 1s. 6d., or some such ridiculous price. The scheme was submitted to the conference of the Prime Minister and the various Ministers of Agriculture which sat in Melbourne. When first introduced it had not a single supporter. It was regarded as a huge, unwieldy scheme, which could not be worked, and as a Socialistic enterprise none of them dare enter upon; and all, including the Prime Minister, than whom there is no keener critic in Australia, refused to touch it until the last day of the conference, when the soundness of the proposal was recognised. This present Liberal Government of Victoria is entirely responsible for the proposal. Eventually the Associated Banks recognised it to be the only practical scheme, and we not only gained their approval, but unanimous agreement to find the money to pay this advance of 3s. a bushel. From beginning to end this scheme has been considered and criticized by the ablest business men, and indorsed by them as the only scheme that will obtain for Australia the highest price for its harvest exported over the seas. The millers, too, would probably admit that they would give something less than f.o.b. prices if there should be a glut in the market, as probably no one is so patriotic as to give farmers more than they are obliged for their wheat.

Mr. Noske.—The banks would not allow us to. (Laughter.)

Mr. Hagelthorn.—Perhaps Mr. Noske would give a shilling more a bushel, but in competition with other less patriotic millers he would not

last long. (Laughter.) We propose that the millers shall not be allowed to buy wheat except through the Government, and the price fixed will be the London parity f.o.b. The farmers under our scheme will not only get full parity price for 30,000,000 bushels of wheat shipped out of the country, but for 10,000,000 bushels used in our internal trade. Our keenest critics acknowledge that it is the only possible scheme. No doubt some men who have been accustomed to handle our harvests as brokers and buyers will squeal at being dispossessed of their profit-mongering until the public are almost persuaded to think there must be something wrong. We want to interfere as little as possible with the ordinary agencies which have handled our wheat in the past, but we cannot have 400 agencies. Still, while our agencies must be limited, we will ask those agents who are appointed by the Government to give every consideration to those who have until recently been earning their money by handling wheat. I happen at this time to control the destinies of Victorian agriculture, and will be largely responsible for carrying out this great Socialistic scheme. There is a great possibility of wrecking my reputation, and I sincerely trust that, unless you find serious mistakes, you will give as much help as possible, relying upon all the intelligence, ability, and honesty that I possess being given to the discharge of my duties and the *bonâ fide* interests of the community. It must be gratifying for you to be told that Mr. J. Weldon Power has had the advantage of looking critically into this scheme, which meets with his hearty and unqualified approval. (Loud applause.)

The Hon. W. L. Baillieu, M.L.C., did not expect the audience to signify their unanimous approval of the scheme as a whole. Men who regard themselves as very keen, when first the proposal was placed before them, shook their wise heads, and said it bordered on Socialism. They were asked to suggest something else, but could not, and he (the speaker) knew of no other scheme that would give equality of opportunity to all producers. We could not expect to market all the wheat this coming season, therefore the strong hand of Government must intervene; otherwise some farmers would sell all their wheat, and others be able to dispose of none. There may be mistakes made, and being made by the Government, they will be known to the world. Private enterprise is guilty of mistakes sometimes, but hushes them up. He had no time for the man who only wanted advice from particular men of a particular cast of thought. We had been very lucky at such a crisis as the present in having such a strong man as Mr. Hughes at the head of affairs. Everything was abnormal these days except our natural disposition to go down on our knees and thank God for our possession of the British Navy. (Cheers.) We were engaged in a struggle for the right to live. He knew there was a good deal of lip service, and many people had said they did not want to make anything this year. Well, he would give them an opportunity to show the genuineness of their meaning. (Applause.)

Mr. Noske stated that the millers had held a meeting, and heartily concurred with the action of the Government, and were pleased to have Mr. Hagelthorn at the head of affairs. Mr. Hagelthorn had estimated the value of wheat at 4s. 9d., but he regarded that as a mistake, because the Government of New South Wales had sold wheat at 56s. a quarter, which would be equivalent to 4s. 3d. in Melbourne yesterday.

Mr. Hagelthorn said the last quotation received by him from London showed 60s. 9d. a quarter, or about 7s. 6d. a bushel. Expenses might fairly be put down at 2s. 9d., leaving 4s. 9d. f.o.b.

Mr. A. S. Rodgers, M.H.R., said he was not in favour of Socialistic schemes, preferring private enterprise. This scheme of Messrs. Hagelthorn and Baillieu would see the farmers through, and insure them full prices for their wheat. It was a bold, big scheme, on the successful carrying out of which the political life of themselves and their Government depended. He had examined every phase of this harvesting problem, and knew of no alternative. From the day that the wheat is parted with until it is sold in London it belongs to the farmer; and all the time it is travelling to London the added weight is accruing to the farmers' credit also. (Hear, hear.) As he had before stated, he had no claim to the origin of the scheme, but he thought it the only scheme that will render the farmer the full value of his two years' labour. He would ask, before sitting down, that Sir John Forrest, whom he had induced to come up and see the bloom and fertility of the Horsham district, should be accorded three hearty Wimmera cheers. The request was vociferously complied with.

Sir John Forrest, M.H.R., P.C., G.C.M.G., spoke of the pleasure his visit had afforded him, and the great impression which the marvellous fertility of the country had made upon his mind. In all his travels he never remembered seeing a better wheat growing district than the Wimmera, or such wheat crops. He expressed the opinion that agricultural research must inevitably react on the farming community, and result in improvement; and he took the view that experimental plots such as he had witnessed that day must be of great value, and he was glad of having been afforded an opportunity of inspecting them. We were not living in ordinary times. If they were ordinary times, this Government wheat-buying scheme would not have been undertaken, but if we remembered that our restricted markets are only kept open and only possible because of our great Navy, as Mr. Baillieu had happily said, we would indeed go down on our knees to thank God for it. (Applause.)

Mr. J. Weldon Power, before parting, referred to the great work that had been accomplished by Mr. A. E. V. Richardson, Superintendent of Agriculture. He could assure Mr. Richardson that he was very highly thought of by the people of the Wimmera, and those who knew him personally felt a very great affection for him.

Mr. R. B. Rees, M.L.C., referred to the wheat scheme, compared with which his own was merely a baby, and he hoped that it would be greeted and attended with the success it deserved.

Mr. James Menzies, M.L.A., joined in favour of the proposed scheme, which was a great departure, but necessitated by the times. He referred to the good work done by Mr. Richardson in the interest of wheat-growers, both of the Wimmera and South Australia, in which latter place were still to be seen evidences of his influence among the farmers. As to Mr. A. C. Drevermann, the Principal of the Longerenong College, he had earned the confidence and affection of the students, and there was not wanting evidence, inside and outside of the institution, that it was being conducted on sound lines, and he trusted that the students

would, in coming years, set the standard, not only in Victoria, but throughout Australia.

Mr. Thomas Young gave an amusing experience of his visit to Melbourne, when some of the financial heads held the opinion that the wheat should be left to finance itself, the same as the wool; but he did not agree with them, and thought he would vote for the Referendum if it would have the effect of making the banks find the money. He considered no better scheme could have been brought forward.

Mr. Walter Rule, President of the Horsham Agricultural Society, feared that, in spite of all schemes, the farmers' Judgment Day would come round just as usual on 4th March, when they would have to meet everything they had signed the previous year. Would the 3s. advance meet the demands against 50 per cent. of the farmers on that date?

Mr. J. Weldon Power said that was not the point. Mr. Rule was mistaking the point for the worry. The point was what would have been the position had we not got 3s. from the Government? The occasion had not been originated by the propounders of the scheme. The propounders had been aroused by the occasion, and it was the only practical scheme by which the farmer could obtain salvation.

A vote of thanks to Mr. J. Weldon Power for presiding brought a very enjoyable afternoon to a close.

FINANCING THE HARVEST.

A Comprehensive Scheme.

[This article appeared in the *Age* of 9th November, 1915.—EDITOR.]

The anxiously awaited official announcement regarding the arrangements made by the Federal and State Governments for the sale and transport of the exportable wheat surplus was made by the Prime Minister (Mr. Hughes) yesterday.

"The news that the conference of Commonwealth and State representatives has agreed upon a comprehensive scheme for financing, storing, selling, and transporting this season's wheat to the oversea markets," said Mr. Hughes, "will be received with very great satisfaction all over Australia. To the producers and others directly interested it will remove a load of anxiety and the growing fear, justified by the circumstances, that much of the new wheat crop could not be marketed, and that in consequence the benefits of the bounteous harvest would be lost. The presage of this disaster, coming on the heels of last year's drought, which brought ruin to some and plunged thousands into debt, filled the minds of the farmers with gloomy forebodings. And satisfaction that a workable scheme has been devised is not confined to the man on the land, but will be felt throughout financial and commercial circles. Every thinking man realizes what failure to market our products at reasonable prices means. The position was, and is, one that needs to be driven home to every citizen. As a community, we live on what we produce:

largely we live on what we sell overseas. Last year we suffered from a drought, and so had little to sell, and are many millions to the bad in consequence. This year, although we have not our normal quantity of wool to sell, we have very much more wheat than we ever had before; and prices of wool and wheat are high. Yet, unless we can find means to transport our produce to the overseas markets, these high prices are only glittering baubles, which mock our plight, but cannot help us in any way. It was to the solution of this problem that the wheat conference of the Commonwealth and States directed its efforts. It accepted without question that the successful marketing of our products was absolutely vital to our national, as well as industrial, welfare. The financial burdens imposed by the war are already very heavy, and are daily growing heavier.

We must sell our products. That is essential. There is no difficulty in finding buyers. The world is clamoring for wheat—the difficulty is to carry the wheat to those who want it. Scarcity of freight is the trouble. Some 25 per cent. of the world's tonnage is either locked up in enemy ports or at the bottom of the sea. Another 20 per cent. has been requisitioned by the Admiralty for transport and war purposes. The British Admiralty, so we are informed, has 800 steamers—not including trawlers—and is requisitioning more every day. The enemy's submarine campaign, although it has suffered a severe check, it still to be reckoned with. Here then is the position: With a greater harvest than we ever have had, calling for nearly twice the tonnage normally required, we find ourselves set an almost impossible task if we are asked to transport our surplus wheat to the oversea markets by the end of June next. By supplementing the freight chartered and to be chartered with the Commonwealth Fleet (of requisitioned and interned enemy steamers) we entertain no doubt whatever that we can carry all the new surplus wheat crop to market, but we do not anticipate being able to do this in the first six months of next year. This, of course, is most satisfactory as far as it goes, and it may be said at once that without the aid of the Commonwealth Fleet and the co-operation of the British Admiralty any attempt to transport our new crop would be hopeless.

But the problem is only half solved. What is the position of the farmer who, with wheat to sell, upon the sale of which he is in fact depending to pay his way, who cannot sell for six or nine months? For it is certain that the wheat-buying firms would only buy wheat to the extent covered by the freight actually allotted to them, and they would not buy any more until they were allotted more freight and had sold the wheat they had bought. Let us see what that would mean to the farmer. In December, January, and February, 1913-14, 615,000 tons were exported. Assuming that we are able to obtain an equal amount of freight during December and the first two months of 1916—we hope to do that, and even more—less than one-half of the estimated amount of wheat available for shipment during that period would be provided for—the remainder would be unable to find transport, and so could not be sold. And this difficulty would continue during subsequent months. And other contingencies may arise which would intensify the difficulties of this situation.

We must not forget that the Empire is at war, fighting for her very existence, and every arrangement for transport is contingent upon the exigencies of war. All freight is now subject to requisition for war

purposes, and, therefore, there is absolutely no guarantee that ships chartered for the purpose of conveying our wheat or those of the Commonwealth Fleet may not be taken by the Admiralty for war purposes. This being so, if we are to avoid disaster, allay uneasiness amongst producers which may lead to them rushing their wheat upon a local market, which could not possibly absorb it, and so bringing about disaster, arrangements to finance the farmer and to enable him to get as far as possible the advantage of the present high prices must be made. This the Conference has done. The scheme, which, as I have already said, covers every phase of the matter, is practicable, and has enlisted the support of the interests necessary to insure its success.

Wheat Buyers Co-operating.

The wheat-buying firms and flour millers have unanimously approved it, and agreed to work under it. It has been submitted to and approved by some of the ablest business and financial men outside of the shipping and wheat interest.

Shortly stated, the scheme is as follows:—The Commonwealth and the respective State Governments to control the receiving, financing, shipping, and marketing of the whole of the wheat crop of the wheat exporting States in excess of seed and feed requirements.

Methods of Control: The internal State organization to carry out the responsibilities as outlined in the preceding paragraph, to be arranged by the respective State Governments co-operating with the interest concerned. A London board, representing Commonwealth and States, is to be appointed, which is to have the co-operation of the London representatives of the principal Australian wheat buying firms. Government agents are to be appointed to receive wheat on behalf of their respective Governments.

Agents' Duties: The Government agents to receive the wheat at various centres, to issue certificates, to store and safeguard it, to consign it to various shipping ports, to ship it, and throughout from reception of shipment to be responsible for the weight, quality, and condition of the wheat. On receipt of the wheat the Government agent to issue a storage certificate showing quality and quantity of wheat delivered. Certificates only to be issued by firm's chief office in State. Quality to be stated in certificate. If inferior, value to be marked.

Advances to Farmers: Arrangements to be made for part payment to holders of certificates on the basis of 3s. per bushel f.o.b. at principal ports of shipment. The difference between the amount thus received and the average price received for all the wheat exported from the States less expenses, including interest, to be paid to the holders of certificates at the close of the season.

London Board: The selling to be intrusted to a London board. Selling commission and charges to be paid at the rate fixed. The returns from sales of each cargo to be credited to the exporting States. Deliveries of wheat under this scheme to cease on 30th September, 1916, and accounts to be paid up, and final payments to farmers to be made subsequent to sale of the last shipment, probably not later than 30th November. As soon as possible after the sale of the last cargoes the Minister to ascertain the net average price realized for the whole of the

wheat shipped by his State, and each farmer to be credited with this rate on the whole of the amount delivered to the Government agent. Provision is to be made for supplying millers with wheat sufficient for their requirements at a price to be approximately the London parity.

The control of the whole scheme is to be vested in a committee representing the Commonwealth and States, with an advisory board of experts.

These are the main principles of the scheme, which, I venture to believe, will commend itself to the producers and to the community in general. It has behind it the resources of the Commonwealth and the States. It is practicable. All the wheat buyers and millers are co-operating under it. They are satisfied it is a workable scheme, and are determined to make it a success. Under it every farmer will get a fair deal; and there will be no scramble; every producer who desires it will get an advance without waiting for his wheat to be shipped. And he will get at the end of the season every penny of the difference between that advance and the average price realized for the wheat exported from his State less expenses. The arrangement covers all sales of the new season's crop, and I, representing the Commonwealth as well as the responsible Ministers of the respective States, appeal with confidence to all concerned to lend it their hearty support."

HORSES ATTACKING GREY-BOX TREES (EUCALYPTUS).

By P. Rankin Scott, Chemist for Agriculture.

A practice fairly common among horses grazing in paddocks containing grey-box trees is for the animal to attack the bark of these trees, presumably in search of some element of material benefit to its sustenance.

These attacks generally follow dry spells, when the paddocks are either comparatively bare of herbage, or the herbage is dry and of inferior quality.

Added interest is attached to this practice, as the animal may be observed to strip off and discard the dry outer layer or epidermis of the bark; it then proceeds to gnaw the more succulent inner cambium layer until it has removed all the bark within its reach. The action of the animal on these trees is a source of annoyance to the stock-owner, as the grey-box tree is not only ornamental, but it possesses practical utility in affording a good shade for stock, besides providing timber for many purposes.

To save the tree against such attacks remedial action is necessary; painting the trunk of the tree with a mixture of grease and Stockholm tar has been found effective. Specimens of the bark having been obtained from a stock-owner in the Goulburn Valley, who has had

experience of this habit of his horses, an analysis of the material was made, and gave the following results:—

<i>Ordinary Fodder Analysis of Edible Portion.</i>			
Moisture	41.66	per cent.	
Ash	8.02	"	
Protein	1.12	"	
Crude fibre	18.87	"	
Nitrogen free extract	30.00	"	
Ether extract	0.33	"	

<i>Water Soluble Extract.</i>			
Volatile matter	7.43	per cent.	
Mineral matter	0.71	"	

<i>Composition of Ash.</i>			
Iron and alumina oxides	0.85	per cent.	
Calcium oxides	53.78	"	
Magnesium oxides	5.03	"	
Potassium oxides	4.92	"	
Phosphoric anhydride	1.18	"	
Sulphuric anhydride	0.76	"	
Silica	0.40	"	
Undetermined, principally CO ₂	37.08	"	

The feeding value of the bark exhibits no abnormal quality that would account for the partiality displayed by the animals. The ash content, however, merits some consideration, as it shows an abnormally high content of lime. This material is not only a component part of the ash of all fodder plants, but varies considerably in different plants. It is worthy of observation in connexion with the mineral content of plants that while the general character remains fairly constant, the various ingredients composing the ash are subject to fluctuations, being governed by such conditions as fertility of the soil, moisture, heat, rapidity of growth, and stage of maturity. The lime content in the ash of wheat, oats, Australian grasses, lucerne, and clover are contrasted hereunder with grey-box-bark:—

<i>Lime in Ash.</i>			
Wheat (grain)	3.47	per cent.	
Wheat (straw)	5.35	"	
Oats (grain)	3.30	"	
Oats (straw)	5.75	"	
Lucerne	31.40	"	
Clover	34.90	"	
Native grasses	2.70	"	
Kangaroo grass	6.78	"	
Edible portion of grey-box bark	53.78	"	

Compared with the average content of native grasses, the lime content of the bark is marked. The probability is that the animal was drawn to feed on the bark in order to supplement a scarcity of lime in its diet. The liking displayed by the animal for the bark apparently indicates that more nutritious pasture was desired, either one containing a fair percentage of leguminous plants, or that the ordinary pasture should be improved by a dressing of bone dust to increase its mineral content. For immediate benefit to animals inclined to this practice, lime may be supplied in the form of a lick—composed of the following ingredients:—6 lbs. superphosphate; 6 lbs. slaked lime; and 5 or 6 lbs. of common salt.

A suitable position for the lick may be made by scooping out the top of an old tree stump and placing in the cavity so formed.

PROFITABLE POTATO PRODUCTION.

By J. T. Ramsay, Potato Expert.

An interesting illustration of the increased yield resulting from the proper storage of seed potatoes is furnished by the experience of Mr. J. G. Outhwaite, of Stony Creek, during the past season. Portion of the seed saved from a crop of the "Up to Date" variety was boxed, *i.e.*, was stored in seed potato boxes from May, 1914, until December, 1914. Another portion of the seed from the same crop was stored from May to November in bags. In November, when the seed stored in bags was planted, it was found that nearly all the tubers had sprouted from every eye. Those tubers which were considered too large to be planted whole were cut for the most part into two sections. In December, when the seed which had been stored in boxes was planted, the potatoes were planted whole, as the majority of them sprouted only from the main eye. The manure used with each lot of seed was the same, *viz.*, 2 cwt. of super-



phosphate per acre. The soil in which they were planted was apparently of the same quality throughout, and the preparation and inter-cultivation given to both lots were also the same. Owing to the fact that the boxed seed was not cut more weight per acre of these was planted. The rates of seeding per acre were:—Boxed seed, 1 ton per acre; bagged seed, 16 cwt. per acre. Although the boxed seed was planted about one month later than the other both lots matured at the same time, and when dug yielded the following weights:—Boxed seed, 13 tons per acre; bagged seed, 8½ tons per acre. These were sold at £5 per ton on rails, and a simple calculation shows that the boxed seed returned fully £20 per acre more than that portion of the seed which was not boxed. The best proof of the economic soundness of any system which is practised commercially is a practical demonstration of the enhanced profit accruing from its adoption. The boxing of seed potatoes, and the digging of potatoes for seed when immature, are continually advocated by this Department, and the example cited is a weighty proof of the profit to be gained from such practice.

LINSEED PRODUCTION.

By Temple A. J. Smith, Chief Field Officer.

At a time like the present, when it behoves the State to extend its small industries as much as possible, attention may well be directed to that part of the Report of the Inter-State Commission, just issued, which deals with linseed oil. It is published hereunder in the hope that the subject may attract the notice of agriculturists in those parts of this State as are suitable for flax culture—

LINSEED OIL. (TARIFF ITEM 234 (1).)

There is but one manufacturer in the Commonwealth. The factory is situated at Parramatta.

This manufacturer first applied that the duty on raw linseed oil might be increased from 6d. to 9d. per gallon, and on boiled or refined linseed oil from 6d. to 1s. per gallon; but his application was afterwards replaced by another *opposing reduction of duty*. He stated that his company produced one-fourth of the total Australian consumption, its output being valued at £60,464 in 1913. In the same year the imports were £192,629. The Australian production was really only about one-seventh of the total consumption, the figures quoted by the witness as his output being based on his selling price compared with the f.o.b. price plus 10 per cent. of the imported oil. The duty of 6d. per gallon is equivalent to an *ad valorem* duty of 25 per cent., apart from the natural protection of freight, &c., which is stated as being a further 4d. per gallon. The seed is imported mostly from India. Practically no linseed is grown in Australia, though a bounty of 10 per cent. on the market price is offered for its production, the bounty being equal to about 25s. per ton of seed; the employment afforded in the oil business by the Tariff assistance is merely that engaged in handling the seed, squeezing it by hydraulic presses, and packing the resultant oil in drums. There is also the secondary operation of boiling carried on in respect of portion of the output, and indirect employment is afforded to some extent in making oil drums, a manufacturer of which has applied for further protection (see *Report on Oil Drums*—Miscellaneous Group III.).

Duty was paid on 1,443,080 gallons of linseed oil in 1913, representing an amount of £36,077 in duty; but including the extra cost of the local oil by reason of the duty of the extra charge to the paint and other trades by reason of the duty would total about £40,000. It was asserted in evidence by the manufacturer that in his factory 26 men were employed, including packers and engine-drivers, and in addition ten youths and four boys, so that the industry has cost £1,000 per annum for each man, youth, and boy employed. The local maker further stated that he expected, with the present duty of 6d. per gallon, to double his output within twelve months. Since then the factory was burnt down, but has been re-erected, and the output largely increased.

Linseed oil is a most important item controlling the manufacture and cost of paints, putty, &c. There is considerable truth in the statement made that 'the price of paint is the price of oil.' As it is the principal ingredient, with white lead and other bases, in the manufacture and application of paint, it is plain that, if high duties are imposed on linseed oil in order to press it from imported seed, all paints and other manufactures in which it is necessary must be protected to an extent which may be deemed abnormal, and which will not only injure the general painting trade but be detrimental to the public interest. A reference to the influence of this factor on the manufacture of putty is given on page 20 of this Report.

A duty of 6d. per gallon simply to encourage pressing out the oil is not justified from an employment point of view as will be seen from a previous paragraph. The only *raison d'être* of such a duty is the encouragement of cultivation of the seed in Australia.

For the purpose of encouraging the local production of flax and linseed, a bounty was granted in the year 1907, payable until 30th June, 1917, of 10 per cent.

on the market value of flax fibre and linseed produced. The payments of bounty so far have been—

	Flax and Hemp.		Linseed (Flax Seed).	
	£		£	
1907-8
1908-9	...	126	...	6
1909-10	...	120	...	...
1910-11	...	123	...	...
1911-12	...	480	...	...
1912-13	...	215	...	9
1913-14	...	318	...	...

To entitle a producer to claim bounty on linseed the seed must be delivered to an oil factory for the manufacture of oil.

It is generally understood that the grower of flax must elect whether he will produce flax fibre or flax seed. He cannot grow both successfully on the one plant. On the other hand, if the fibre is desired, he must sacrifice the seed, and encourage the fibre growth; on the other hand, if it is the seed which is desired, then the cultivation must be specially diverted to attain that end. If the grower cultivates for both fibre and seed, the seed is of a comparatively low value. The figures given above would seem to indicate that, so far, it is found more profitable to grow for fibre, although that, as yet, is a very small industry.

In addition to the oil manufacture, the crushing of the seed provides a by-product in oil cake, a valuable cattle food, about 70 tons of which are produced in the process of extracting 8,000 gallons of oil; but this has only been in particular demand in times of drought and scarcity, half the Sydney output, we are informed, being exported.

Only about 200 tons of linseed per annum are produced in Australia, and that in Victoria, where it goes into general consumption for fodder and other purposes.

Messrs. Meggitt Limited are the only regular buyers of linseed for oil crushing, and the duty on oil plus the 10 per cent. bounty has evidently not enabled a price to be given sufficient to induce farmers and land-owners to embark in the cultivation of the plant, as against the price of imported linseed, which is free of duty. To encourage the cultivation of linseed by a duty on the seed would, at the present time, still further embarrass the industry.

The crop of linseed in the United States equals about 26 million bushels per annum, most of this being pressed for oil. Russia averages 17 million bushels annually; the production of India varies from 15 to 20 millions, nearly all of which is exported; the Argentine, under average conditions, exports nearly 30 million bushels. In 1913, 17½ million bushels were grown in Canada, where the industry is sufficiently developed to warrant protection by a duty of 6d. per gallon on linseed oil, and 4d. per bushel on the seed.

Linseed grows best in the colder portions of the temperate regions, but is cultivated anywhere between latitude 10° to 65° south, and probably within similar latitudes north. Evidence was given by Mr. Meggitt that the grower should average half-a-ton of seed to the acre, but the average crop in Canada is said to be 11½ bushels (= 650 lbs.) to the acre. In North-west America, freshly-broken land under favorable conditions gives 10 to 15 bushels, the stalks of the plant producing 2 tons of straw. It is necessary to grow linseed in rotation with other products.

The price of linseed varies from £10 to £15 per ton, and the price the Australian oil miller can give depends on the price he receives for oil cake, which is a by-product. In England, America, and Canada this is in great request for stall-fed cattle, and, during the shortage of fodder in Australia, Messrs. Meggitt have easily disposed of all their output to advantage. In an ordinary season it has been necessary to ship about half of their tonnage of cake abroad. With abundant pastures in favorable seasons, the local demand for oil cake, other than for stall-fed stock, will necessarily be limited.

As the present necessities in Australia would entail the cultivation of 45,000 to 50,000 acres for linseed, a strong effort should be made to grow this in Australia. It would provide a further primary product in which the cost of labour in cultivation and harvesting is not excessive, and in which the value of the local demand would be equal to £250,000 per annum. If the State Agricultural Departments were asked to lend their assistance to put the matter plainly before the farmers, the result may perhaps be accomplished. Seed grown at Yanco and

other parts of the Riverina was declared to be excellent for oil, and the plant will thrive well in a great many districts.

Professor Bolley's work, quoted at length in *Farmers' Bulletin No. 274* on 'Flax Culture,' issued by the United States Department of Agriculture, has been of immense advantage to the growers of flax for seed and fibre in America.

To keep the present duty on linseed oil would require the duty on paints prepared for use, putty, &c., to be raised considerably to adequately protect the paint manufacturer; but, till the cultivation of linseed has progressed to an extent which would justify a duty on seed, the duty on oil is not only a direct hindrance to industry without any compensating advantage, but a very heavy burden on the community.

RECOMMENDATION.

The Commission recommends that the duty on linseed oil be removed, and suggests that the bounty on linseed delivered to a factory for the manufacture of oil be raised from 10 to 15 per cent. on the local market value for a period of five years, so as to provide a further inducement to the grower to cultivate the Australian requirements. In order to give time for consideration and action by the Agricultural Departments, it is recommended that a bounty of 3d. per gallon be paid on linseed oil locally expressed from local or imported linseed till 30th June, 1917, but that after that date a bounty of 6d. per gallon be paid on linseed oil the product of Australian-grown linseed. The Commission is of the opinion that this is the surest way to encourage the whole industry."

The main points in the above report which should appeal to Victorian farmers are—

Firstly, the large field for expansion presented before over-production for local requirements would be exceeded. Only 200 tons are at present produced per annum, which, on average returns, represents about 500 acres, and no less than 50,000 acres would be required to supply Australian consumption.

Secondly, the average price of linseed, viz., £12 10s. per ton, on an average crop of half a ton per acre (£6 5s. gross) should prove more profitable than many other crops now cultivated.

Added to the gross return from the sale of the actual crop, the Commission recommends a bounty of 15 per cent. per ton on linseed delivered to a factory for the manufacture of oil. This would increase the value of the crop to the grower 18s. 9d., or a total gross return on a half-ton crop of £7 3s. 9d. per acre for seed alone.

Where linseed is the objective of the farmer, the fibre is of small value, being coarse and hard, and it is doubtful at the present time whether it would command a price sufficient to warrant the necessary trouble in preparing it for market.

Some authorities argue that it is possible to obtain both seed and fibre from the crop, but all agree that where the crop is grown for fibre the seed will suffer in point of yield and also in its capacity to produce oil, while if grown for seed the fibre will be of inferior quality.

Good seed will give from 30 per cent. to 37 per cent. of oil, and bad seed from 25 per cent. to 30 per cent.

It will readily be seen, therefore, that manufacturers of either oil or fibre must reduce prices, unless growers specialize for either good seed or fibre. The crop under review in this article, however, relates to seed production primarily, and the necessary conditions suitable for its cultivation and treatment are being dealt with as a guide to intending growers

SOILS AND CLIMATE.

New lands of good quality, either sandy loam, chocolate, or rich black loam, produce the greatest quantity of seed with the highest oil

content. Sandy or gravelly soils are not desirable, neither are heavy clays. Good drainage is essential, as linseed does not like cold, wet conditions. The crop is especially suited to new land just broken up, and is useful for subduing such land for succeeding crops. New land is also free from the diseases which are liable to attack the crop.

Cool climates are best, and there are many districts in Victoria suitable, notably along the foot-hills in the north-east, Gippsland, the Western District, and central portions of the State. The northern and north-western portions, excepting where irrigation is possible, have rather too uncertain a rainfall.

Flax has the reputation of being hard on the land when grown for several years consecutively on the same soil, but this is due more to disease, or what is known as flax sickness, than to its effect on soil fertility. For this reason a judicious system of rotation cropping is especially necessary to insure successful linseed production. On old ground a crop of linseed should not be grown more than once in every four years, while some authorities claim that once in every seven years should be the course to adopt. In fixing a rotation system, it should be borne in mind that the crop follows peas, rye, vetches, and maize well, but it is not desirable to sow linseed immediately after exhaustive root crops, such as mangels. Where possible, it should be the first crop after the land has had a spell under pasture, and will not be found to affect the soil for succeeding crops to a greater extent than the usual cereals grown on the farm. The following analyses, showing the comparative demands made by wheat and flax, go to show that, with the exception of nitrogen and lime, flax takes considerably less than wheat of the food constituents required:—

20 bushels Wheat: Nitrogen, 35 lbs.; phosphoric acid, 20 lbs.; potash, 35 lbs.; lime, 8 lbs.
15 bushels Flax: Nitrogen, 54 lbs.; phosphoric acid, 18 lbs.; potash, 27 lbs.; lime, 16 lbs.

PREPARATION OF THE LAND.

Linseed requires a very fine, firm seed-bed, and all possible care to eradicate weeds and get the land clean should be exercised. An early fallow in the autumn is especially valuable, in that it assists in cleaning the land, and gives greater opportunity for making a good seed bed. It will also be seen that the crop is a fairly heavy nitrogen feeder, and an early fallow will have the effect of supplying a sufficiency of this most essential plant food. On old land deep ploughing is necessary to obtain good results, and on loose, friable soils a heavy roller will compact the seed-bed, and provide better germination.

MANURES.

Artificial fertilizers are not much used for the crop, but there can be no doubt that they would be beneficial. Superphosphate, at the rate of 1 cwt. per acre, would just about supply an average crop with sufficient phosphoric acid for its development, while lime on soils naturally deficient should be applied at the rate of at least 5 cwt. per acre. Nitrogenous manures should not be required artificially if early fallowing has been practised, or a proper rotation followed, and on a poor soil 1 cwt. to 1½ cwt. of potash would be advisable.

Farmyard or stable manure has a special value, in that it supplies humus in addition to the various plant foods contained, but care should

be taken to use only well decomposed manure of this description; otherwise there is a liability of trouble from the seeds of weeds, grasses, &c.

The ploughing in of green crops, such as rye, pease, and clover on old land also has desirable results.

SEED.

Probably the chief reason for the low returns of linseed obtained in Victoria is due to the fact that varieties more suitable to produce fibre than seed have been grown. Where linseed is the object in view, only the seed best fitted to produce linseed should be used, and that of the very best quality. Too much stress cannot be laid on the importance of securing clean, bright, plump seed of varieties grown for seed only. Much attention has been given to this phase of the industry in North Dakota, United States of America, and the Argentine. Russia at one time was the chief source of supply, but improved methods of selection and treatment of the seed by the American growers appears to be ousting the Russian seed from its previous control of the market.

No. 3 Dutch "Rotterdam" seed is said to be one of the best varieties to grow, and the best of the American and Argentine would probably suit Victorian conditions. Fresh seed should be imported every second year, as a change of seed appears to be imperative after the second season.

Graded seed should be used, and before sowing it should be treated with a formalin solution of 1 pint of 40 per cent. strength in 45 gallons of water. This destroys the spores of the wilt-fungus, and actually benefits the seed. The best system is to sprinkle a heap of 8 or 10 bushels, and to keep turning the heap at the same time (half-a-gallon to each bushel is sufficient), and then cover with bags or a tarpaulin for a couple of hours; sow within twelve hours of treatment.

The rate at which the seed should be applied for linseed production is $\frac{1}{2}$ to $\frac{3}{4}$ bushel per acre. For flax, more than twice this quantity is required.

The time to sow depends upon the season to some extent, as a warm seed-bed is of great importance. Autumn seeding, when the land is in good order, would suit mild districts, and spring sowing in the colder portions of the State which enjoy good rainfalls. The depth of seeding should not be more than half-an-inch, and the necessity for a finely cultivated seed-bed is here apparent, as in rough, cloddy land a uniform depth could not be maintained. Broadcast sowing is the most popular method, as the drill is liable to sow too great a depth on ridges or uneven land. After seeding the roller should follow to compact the soil round the seed to insure good germination; rolling is particularly necessary on friable, loose soils.

HARVESTING.

The crop is harvested for seed when the first seed-pods are browned and ready to open. The crop matures somewhat unevenly, but if cut with the binder at the stage mentioned, the greener pods will ripen on the straw. The sheaves must be stooked until dry enough to cart in and stack without danger of mildewing. A tarpaulin on the floor of the waggon used for carting in will save much waste, as the riper pods will shell easily when handled, and waste will occur unless precautions are taken to save the loose seed.

The crop can be threshed with a flail, or on a spiked roller, or through an ordinary cereal threshing machine. In the last-mentioned case, however, the fibre, if of any value, will be ruined. All linseed should be stored in a dry place, as it is easily destroyed by mildews.

DISEASES.

Flax wilt is the most common trouble, caused generally by the condition known as a flax-sick soil. This is a fungus disease which enters the young plant either from spores on the seed or in the soil. This fungus develops inside the tissues of the plant, causing it to die.

Clean seed, treated with formalin, sown on land free from the disease, is the remedy, and a long rotation in which linseed is cropped once in five to seven years.

Manure containing flax straw, or from animals fed on flax, should not be used.

Other fungus diseases yield to the same methods of treatment, and the crop is not subject to serious injury from insect pests.

SUMMARY.

Victorian statistics show that the average yield of linseed in years 1910-11-12, from an aggregate of 2,256 acres, was 294 lbs. per acre. This is an exceedingly low yield, and is probably due to the fact that no special effort has been made to obtain the right seed, and cultivate for linseed only. The average crop in America is 650 lbs. per acre, and crops of 1,500 lbs. have been obtained. Crops of 1,000 lbs. of seed per acre should be easily possible on our comparatively virgin soils.

In growing for seed alone, much of the handling necessary where fibre is the objective is avoided. The cost of producing the crop should not exceed that of ordinary cereals. There are large areas of land fitted to produce linseed in Victoria, and there appears to be no reason why the crop should not become one of the most useful and profitable grown, provided proper attention is paid to the essential points in regard to the right seed, a reasonable rotation, and thoroughly good system of cultivation.

EXPERIMENTS in the manuring of grass lands were commenced in 1914 at five centres in Northamptonshire (England), on land typical of the very large areas of poor, cold pastures, on clay land, which are found throughout the country. Superphosphate was usually more effective than basic slag, although slag did better than might have been expected considering it was applied late and the season was dry.

THERE are men who understand breeding who do not even advocate the practice of breeding the sire to his grade offspring. It is a practice we believe, on the whole, gives better results, and more good comes from it than securing another bull, and it is more economical.—*Hoard's Dairyman*.

THE FRUIT TRADE OF VICTORIA AND THE WAR.

By Ernest Meeking, Senior Fruit Inspector.

Introduction.

The cataclysm into which Europe was suddenly plunged at the beginning of August, 1914, has profoundly affected trade and commerce to the uttermost ends of the world. All industries and trades in all countries have more or less felt its effects, and on some industries the blow has fallen so heavily that years of effort will be required to bring about their re-establishment. One of our great statesmen long ago said that war leaves no nation as before, and the truth of this is now being brought home, not only to the belligerent nations, but to neutral countries as well.

Owing to last year's drought the effects of the war have not yet been fully manifested with regard to the distribution and marketing of our primary products. The time, however, is now at hand when the problem must be faced, and means considered whereunder this may be successfully solved. To no other of our primary industries is the present position fraught with such significance as it is to the fruit trade. Considering the perishable nature of fruit, and with a record crop in prospect, the largest oversea market gone, a scarcity of labour, and disarranged transport facilities, the need for prompt and organized effort to meet the changed conditions is obvious. However, "new occasions teach new duties," and, although the prospect is certainly grave, the task of successfully coping with the situation should by no means prove impossible.

The fruit-growers on the North American continent were faced with a much more serious position on the outbreak of war last year. Hostilities began as they were on the eve of harvesting one of the largest crops on record. Little or no time was available to arrange for meeting the situation, and no experience was at hand to afford a lesson. The transport facilities were completely upset, and none could foresee what period would elapse before they could be effectually readjusted.

How the situation was successfully met, both in the United States and Canada, cannot here be told; but it must suffice to say that the result was a veritable triumph of organized effort. There appears no reason why a like result cannot be accomplished in Australia with respect to the disposal of the incoming fruit crop, and the present article is written to show what are considered the ways and means to this end.

Oversea Markets.

GERMAN TRADE.

The loss of the trade with Germany has created a serious position in connexion with the oversea export of fruit, as, out of a total of 356,616 cases shipped to Europe during season 1914, 202,857 cases, or approximately 57 per cent., were shipped to Germany. Doubtless, a certain proportion of this was distributed from Hamburg and Bremen to other European ports, but the major portion of the total was consumed in Germany. Owing to its geographical position, and for other reasons, no other European port could at present take the place of Hamburg as a

centre for marketing and distributing facilities. Still, with the diversion of trade into new channels, which will doubtless eventuate as a result of the war, many other European ports should pay for exploitation.

It must not be forgotten that the trade with Germany has arisen within a comparatively short time, as, prior to 1902, no fruit was shipped direct from Australia to Germany. In that year the total export to Germany consisted of 5,250 cases. In fact, this argument might be altogether applied to the oversea fruit export trade, as it is only since 1907 that the industry has attained anything like important dimensions. Prior to that year no season's total had reached the six figures; but in 1907 the figures jumped to 180,766 cases from a total of 82,052 cases in 1906. The increase since 1907 has been rapid and continuous.

Trade with the United Kingdom.

FUTURE PROSPECTS.

From a total of 356,616 cases exported to Europe from Victoria during 1914 season, 153,759 cases, or approximately 37 per cent., were shipped to the United Kingdom.

A study of the channels through which the import trade in fruit enters the United Kingdom, and the extent to which the war is likely to affect the sources of supply, should be of value in attempting to gauge the position which the war may create with respect to our future share in the trade.

Apples.—In apples alone the United Kingdom, in 1913, imported from all countries 9,122,158 bushels, valued at £2,230,370. Of this total the United States of America contributed over two-fifths, and Canada slightly under two-fifths. The total from these two countries amounted to 7,422,024 bushels. European countries contributed less than one-eleventh; Australia, one-twelfth; other British possessions, excepting Canada and Australia, about one-one hundred and seventieth; Victoria, less than one-sixtieth.

As the United Kingdom obtains most of her apples from Canada and the United States, the stoppage of European supplies through the war should not, therefore, materially affect the situation so far as apples are concerned.

Pears.—In 1913 the United Kingdom imported 2,013,004 bushels, valued at £650,084. Of this total, Germany, Holland, Belgium, and France contributed 1,116,505 bushels, or more than half the total; the United States, 692,762, or slightly over one-third; Canada, 100,276 bushels, or under one-twentieth; Australia, 72,066 bushels, or approximately one-thirtieth. The main supplies from the continent of Europe came from Belgium and France. These countries contributed 893,492 bushels, or over one-third of the total.

As it would appear from the foregoing that there is likely to be a dearth of pears in the United Kingdom until the readjustment of trade after the war, the prospects for establishing a large and profitable trade in this fruit are very good, as it has been proved during recent years that pears can be successfully exported to the United Kingdom.

Plums.—Imports in 1913, 1,111,250 bushels, valued at £437,306.

The continent of Europe furnishes practically the whole supply, as a total of 1,109,803 bushels were imported from there in 1913. The

principal exporting countries were Germany and France, which shipped to Great Britain 644,051 and 314,230 bushels respectively. It would seem, therefore, that the shortage in plums will be even greater than the shortage in pears. The possibility of landing these in the United Kingdom in good condition has also been established.

Importing Centres in Great Britain other than London.

(1)—HULL.

Mention has often been made during the past few seasons regarding the expediency of opening up a regular trade with Hull. The optimistic opinions expressed in many quarters that regular shipments of fruit to Hull could be undertaken with profit appear justified by the results which have already been obtained from shipments to that port. The most notable example was the *Clan McArthur* shipment in 1913 season, when 12,500 cases realized the high average price of 12s. per case; 1,400 cases shipped per s.s. *Otway* last season also realized an average price of 12s. per case. When it is considered that upwards of 10,000,000 people reside within a 50-miles radius of Hull, and that it is the nearest distributing port for the principal northern counties of England, including such thickly populated centres as Yorkshire, Lancashire, &c., that it is the third port in the values of imports and exports in the United Kingdom and, in addition, the most conveniently situated British trading port for Holland, Scandinavia, Russia, Denmark, and other northern European countries, it seems strange that full advantage has not already been taken to ship fruit to this port. Shipments of soft fruits are imported direct through Hull into England from Holland, France, Belgium, Germany, and even Sweden, Norway, and Russia. Apples are imported from Canada, the United States, a few cases from Australia; oranges from Spain and Palestine; grapes from Spain; lemons from Sicily; and bananas from the Canary Islands and West Indies. The volume of the trade may be gauged when it is stated that in 1913 1,823,393 packages were imported, with an approximate value of £656,501. Of this total the hard fruits (apples, pears, citrus fruits, &c.), represented a value of approximately £300,000, or nearly half the total value. The value of the apples and pears was approximately £150,000. Two-thirds of these were imported from America. The importation of American apples is not so large as at some of the other British ports, and is due to the fact that Hull is not so favorably situated as Liverpool, Bristol, and London for the American trade.

Fruit is mainly imported into Great Britain between the months of May and September. During this period the Hull fruit sales are the most numerous attended of any sales in the United Kingdom, and are patronized by foreign buyers, or their representatives, in large numbers. But, in addition, the sales in Hull attract buyers throughout the year. All the facilities for disposal of fruit are, therefore, available. The markets are more accessible to the wharfs than is the case at either London or Liverpool, and consignments can, therefore, be handled more expeditiously and cheaply.

A large proportion of the apples shipped from Australia to London and Liverpool are railed to Hull for export to the Continent, as is shown by the fact that hard fruits to the value of £386,326 were disposed of at Hull and exported to Continental ports. This means the following additional railage cost:—London to Hull, 24s. 3d. per ton of

2-ton trucks; smaller lots, 28s. 7d. per ton; Liverpool to Hull, 16s. 6d. per ton. This cost must ultimately fall on the Australian grower, and would be saved if shipments were made direct to Hull.

The main reason why fruit has not been shipped in large quantities from Australia to this port has been the lack of direct shipping facilities; but this was overcome to some extent last year by the monthly service of steamers belonging to the "Clan" line. With the diversion of trade, which it is anticipated will occur, a fortnightly service will doubtless be arranged for in the future, and there seems no reason why Hull should not, to a large extent, occupy the position in connexion with the fruit trade which was held by Hamburg in the past. In fact, had direct shipping facilities been available to Hull, it is probable that Hamburg would never have attained its position of the leading port for Australian fruits.

The following is a comparison of the pre-war cost of landing a case of fruit in Hamburg, London, and Hull:—

Items of Charges.	Hamburg.	London.	Hull.
	per case.	per case.	per case.
	s. d.	s. d.	s. d.
Melbourne Charges—			
Cost of case	1 0	1 0	1 0
Packing	0 2	0 2	0 2
Wrappers, nailing, &c. .. .	0 1	0 1	0 1
Rail freight	0 3	0 3	0 3
Supervision fee	0 3	0 3	0 3
Insurance, 12s. 6d. per cent. <i>ad valorem</i> ..	0 0½	0 0½	0 0½
Oversea Freight—			
Hamburg, 65s. per ton .. .	2 8½	2 6	2 6
London, 60s. per ton .. .			
Hull, 60s. per ton .. .			
European Charges—			
Landing, carting, &c. .. .	0 8	0 6	0 4½
Selling charges	0 6	0 6	0 2½
	5 8½	5 3½	4 10½

The cost of marketing a case of Victorian-grown fruit in Hull was thus 5d. less than in London, and 9½d. less than in Hamburg.

(2)—MANCHESTER.

This city is in adjacent proximity to the densely populated counties of west and north-west Great Britain. Over 10,000,000 people are included in its distributive area, 2,000,000 of these being in the immediate vicinity of the ship canal. It has quay and dock accommodation, and is also provided with cool storage accommodation, adjacent to the docks. The charges for disposal of fruit are lower than in London, being as follows:—Manchester, 6d. per box of 40 lbs., plus 2 per cent. for brokerage of sale in the auction room; London, 9d. and 10d. per box of 50 lbs., plus 5 per cent. for brokerage. Unfortunately, no direct steam-ship service from Australia has yet been opened, although within a radius of 70 miles of Manchester there is a consuming population twice as large as the combined population of Australia and New Zealand.

(3)—OTHER BRITISH PORTS.

There are many other British ports, such as Glasgow, Bristol, &c., which are in themselves centres of large populations, and which should provide good markets for our fruits.

American Trade.

CALIFORNIA AND VANCOUVER.

Several trial shipments have been forwarded by the Department of Agriculture to San Francisco and Vancouver. This was undertaken in order to show that at certain times of the year a profitable trade could be established if a direct steam-ship service were in commission. Although disabilities such as transshipment, and high freight charges, and undue handling of the fruit, were prohibitive to the establishment of a regular trade, yet the prices obtained showed that, with a direct service, fruit, and more especially soft fruits, could be shipped with great advantage.

Inquiries show that the prospects of a direct service to these ports are not encouraging, as the Union Steam-ship Company state that, owing to want of inducement, they cannot see their way clear to undertake this. Last season the *Canada Cape* loaded a small cargo here, but as nothing was added at Sydney the trip was abandoned.

THE EASTERN STATES OF AMERICA.

It has frequently been stated that a good market for apples and pears exists in the eastern States of America, particularly during the months of February, March, April, May, and June. A return for the last 25 years shows the average prices for apples per box during these months to be as follows.—February, 1 dollar 8 cents; March, 1 dollar 11 cents; April, 1 dollar 19 cents; May, 1 dollar 28 cents; June, 1 dollar 23 cents; or approximately an average price of 1 dollar 18 cents—equalling 4s. 11d. per case. These figures must not be taken as an indication of the prices which would be realized for well-packed Australian apples, as the prices refer to American stocks which have been kept in cool storage for many months. It would appear, however, that unless a direct steam-ship service is established, and freights are kept as low as possible, the New York market and other markets in the eastern States will not provide a permanently profitable outlay for our fruits.

No figures are available concerning the prices for pears, but small shipments which have been sent from Tasmania to New York have realized profitable returns.

All apples shipped to the United States should be packed under the numerical system of packing. They should be packed in boxes of the sizes provided by law, viz., 18½ inches long, by 10½ inches deep, by 11½ inches wide.

From the latest reports to hand, the crop prospects for the present (1915) season in Canada and the United States of America may be summarized as follow:—

There has been no improvement in the condition of the apple crop in any part of Canada since the last report, with the exception of Nova Scotia, where the weather of late has been favorable to the colouring of the fruit. Continued wet weather in Ontario for the past six weeks has, if anything, lowered the quality of the fruit in some sections by causing the development of fungus diseases. In Nova Scotia the crop will be particularly poor in quality, and

probably will not average more than 30 per cent. of No. 1 apples. Taking the Dominion as a whole, it seems probable that 1915 will be long remembered as a year of low production and poor quality.

The total production of apples in the United States for this season is estimated at 205,333,000 bushels, as against 253,200,000 bushels last year. Peaches are estimated on the same date at 59,707,000 bushels, as against 54,000,000 last year, and pears at 11,068,000 bushels, as compared with 12,086,000 in 1914. The following are the percentages of the apple crop in the large apple-producing districts. These are based on 100 as representing full or standard crop:—

	Condition 1st August, 1915. Per cent.	Ten-year Average. Per cent.
New England States ...	49	65
Eastern States, N.Y., Pa., &c. ...	69	61
Middle West ...	69	53
Western States ...	75	77

This gives a 63 per cent. total for the whole of the United States.

There is little prospect, therefore, that American stocks will seriously compete with our apples on the markets of the United Kingdom during the coming season. There seems, moreover, good ground for believing that, in spite of the low average returns indicated by the figures above, high prices for Australian apples could be obtained in the eastern States during the months of February, March, April, May, and June of 1916.

Owing to the shortage of stocks, due to last season's failure, American apples are at present bringing from 18s. to 22s. per case in Australia, and there is every indication that our exporters would obtain similar results if judicious shipments were made to New York and other cities on the Atlantic seaboard.

They would strike markets where fruit was scarce, and, owing to the enormous influx of capital from Europe, where money was plentiful. In fact, it may be confidently expected that America would absorb considerably more fruit than the quantity represented by the loss in the German trade.

The manner in which the American apples, which are now arriving in Australia, are packed, graded and boxed, provides a striking commentary on our want of organized attention to these matters. The fruit in each box is carefully wrapped, packed, and graded with respect to uniformity in size, colour, variety, shape, and soundness, and freedom from disease. The boxes themselves are constructed of clean-dressed pine, bear an attractive stencilled brand of the association by whom they are packed; a statement as to the size and number of apples in box and guarantees as to the size of the box, and the soundness and freedom from disease of the fruit. All the information that an intending buyer requires is therefore shown on the box, and the fruit may be safely purchased without inspection.

Local Trade.

In detail, the following quantities, in bushels, of large fruits gathered in Victoria during 1913 were:—Apples, 2,036,756; pears, 669,898; quinces, 90,119; plums, 260,830; cherries, 152,257; peaches, 289,731; apricots, 138,881; oranges, 44,039; loquats, 6,006; passion fruit, 6,360; nectarines, 5,130; lemons, 48,170; figs, 25,233. Total, 3,773,400.

The prospective total quantity of fruit for the incoming season promises to exceed the 1913 season, and will probably constitute a record.

Small Consumption of Fruit in Victoria.

When it is considered that only slightly over 50 per cent. of the large fruit grown is consumed locally, and that only $3\frac{1}{2}$ ounces of fruit per day per individual is consumed, as against 9 ounces of meat and 12 ounces of bread, little difficulty should be experienced in increasing the local consumption at least another 25 per cent. If this could be accomplished, the danger of glut should be totally avoided, and the present serious outlook would be entirely removed, as the remaining 25 per cent. should be easily disposed of in the Inter-State and over-sea markets.

Improved Methods of Local Distribution.

The better local distribution and sale of our fresh fruits could be brought about by extending the system of street selling in Melbourne, and by establishing a single case retail trade to provide householders in the suburbs. The State Royal Commission, in its report, recommends an amendment of the law relating to hawking and dealing to permit the issue of an annual license to hawkers and dealers of fruit and vegetables, in lieu of the local market rates at present collected, and also recommends the establishment of sixty-four stands in various portions of the city. This would undoubtedly tend to dispose of considerably greater quantities of fruit to the public than is possible under present arrangements, as one of the great drawbacks to the local consumption of fruit is the want of facilities for direct retail sale to consumers.

Recommendations of Royal Commission.

The two Royal Commissions which have been held in recent years to inquire into the fruit industry have both reported that the industry suffers under many disabilities. These disabilities have been found to be nearly all connected with the distribution and marketing side of the industry, and have confirmed the opinions which have been expressed in the columns of this journal during the past few years. The last Commission, which was appointed by the present Parliament, and which took evidence during the current year, stressed in its recent report the importance of the industry, and urged the imperative necessity for immediate attention to its development on sounder and more improved lines than those now existing. Their recommendations regarding the provisions which should be made against glut are worthy of the most earnest consideration of all concerned, especially at the present time, when the industry is faced with all the factors which tend to bring this about.

The following facts in connexion with the present position of the local and Inter-State trade may serve to indicate how this position could be materially improved:—

PRESENT CHANNELS OF CONSUMPTION.

In 1913 (which may be taken as the last heavy pre-war crop as it was up to the present the heaviest on record) a total of nearly 4,000,000 bushels of large fruits and 60,000 bushels of small fruits, exclusive of grapes, were raised in Victoria. Of this total 500,000 packages (approximately 12 per cent.) were exported over-sea: 1,000,000 bushels (approximately 25 per cent.) were manufactured into jams, jellies, &c.;

60,000 bushels (approximately $1\frac{1}{2}$ per cent.) were converted into dried fruits. This gave a total of 1,910,000 bushels exported, manufactured, or otherwise disposed of, and left a total of 2,090,000 bushels, or approximately $52\frac{1}{2}$ per cent. for local consumption.

If standardized methods of packing were established here, there is no doubt that a regular and permanent single case retail trade could be established with householders in the suburbs. This has been successfully carried out in other countries under various systems. One of the most efficient is to circularize or canvass householders, stating the conditions under which apples will be delivered, and quoting prices. The circular may be accompanied by a sample apple, and prices are quoted at which a full box, or half-box, similar to sample, can be delivered at the house in the suburbs, or office in the city. This campaign has resulted very successfully in many cities, but, of course, requires combined and organized methods to properly carry out.

Inter-State Trade.

The kinds of fruit exported to other States consisted chiefly, in 1913, of apples, cherries, and plums. Of this total, pears formed over 50 per cent.; apples, 20 per cent.; plums and cherries, approximately, 30 per cent. Our best customers were Queensland and New South Wales. Most of the fruit was transported by Inter-State boats as ordinary cargo. As a result, its condition on arrival prevented its keeping for a sufficient length of time to enable proper distribution throughout the States to which it was shipped. There seems little doubt that, if the Inter-State boats were provided with sufficient cool chamber accommodation, and more careful methods of picking, packing, and handling were applied than those now in vogue, fruit could be landed in better condition at Inter-State ports than is possible at present. The rates of freight charged on fruit from Melbourne to other Inter-State ports is considerably higher than the return rates, and it would appear that there is justification for asking that these be lowered. A large quantity of fruit is forwarded to other States by rail, and the Inter-State rail gauge between Victoria and New South Wales, necessitating the transfer of fruit at the border, constitutes a serious drawback. Considering the large proportion of trade which is occupied by the shipment of fruits to Inter-State markets, the better development of these markets would well repay effort.

Extension of Dried Fruit Industry.

Judging by the figures, it would appear that the proportion used in 1913 in the manufacture of dried fruits ($1\frac{1}{2}$ per cent. of the total crop) could be materially increased by the establishment of up-to-date drying plants. These plants could, in many instances, be erected in proximity to the cool stores in the various fruit-growing centres. The process of drying fruits is very simple and requires nothing more than ordinary care and intelligence to carry out successfully. The old methods of drying fruits by sun heat, or by means of small kilns in the orchard, is fast becoming obsolete, and in California and other large fruit-producing States of America, large plants are utilized, which successfully carry out in a few hours the process which required five or six days under the old method. For example, in one of the American States, a company

has erected an evaporator capable of turning out 10 tons of prunes, 12,000 lbs. of cherries, or 15,000 lbs. of peaches or apricots, in 24 hours. The method is carried out by running the fruit through the evaporator on steel cars worked by a continuous belt or chain, which provides for an unbroken procession of fruit through the evaporator. The temperature used is from 212-240 degrees Fahrenheit, and it takes 3 hours to evaporate apples; 8 hours for cherries; 10 hours for peaches; 8-10 hours for apricots, and 6-12 hours for prunes. A few plants, such as those in the large fruit-growing centres, would materially assist in solving the problem of disposing of the surplus crop in seasons when fruit is plentiful, and would, moreover, assist in keeping down expenditure to a minimum.

The following figures show the losses in weight for the various kinds of fruit:—

Fruit.		Fresh.		Dried.
Apples	...	100 lbs.	...	12 lbs.
Pears	...	100 lbs.	...	12-15 lbs.
Plums	...	100 lbs.	...	25 lbs.
Apricots	...	100 lbs.	...	10-12 lbs.
Peaches	...	100 lbs.	...	10-12 lbs.

The cost of conversion for a bushel of the fruits mentioned averages from 8d. to 1s. 10d., and varies in lbs. yielded per bushel of fresh fruit from 6 to 8 lbs. of the dried product.

A good market exists in Australia for dried fruits at profitable prices, and the prospects for the expansion of the export trade overseas are of the best.

Summary.

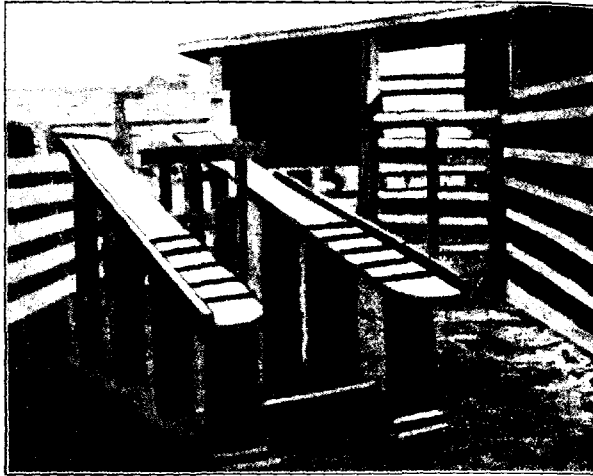
Prospects for the incoming season may be briefly summarized as follows:—

1. A record crop is expected in each of the Australian States.
2. This season it is estimated that had shipping and marketing conditions remained normal the following quantities in bushels would have been available for overseas export:—
Tasmania, 1,500,000; Victoria, 500,000; South Australia, 300,000; West Australia, 250,000. Total, 2,550,000 bushels.
3. Transport and other facilities for placing fruits on overseas markets will be disarranged.
4. Space will, in all probability, be obtainable for $\frac{2}{3}$ only of the full available surplus.
5. This means that a much larger quantity than usual will be left for disposal on the local and Inter-State markets; but with organized effort in the directions indicated, this should not be impossible, and the creation of a glut, with consequent loss, should be easily avoided.

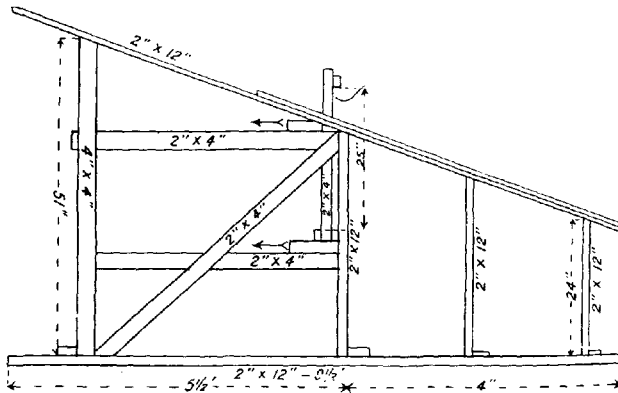


A BREEDING RACK.

The accompanying illustration shows a very convenient breeding rack, not only for heifers, but for mature cows when bull is large and



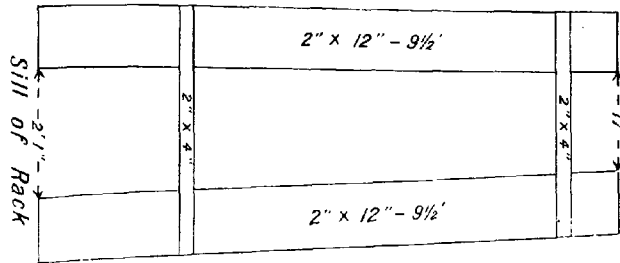
Breeding rack with adjustable stanchions for use with large bulls.



Side view of breeding rack showing dimensions and construction.

heavy. It must be strong and well braced to stand the strain. Cleats placed above the surface of planks at the side are important. The

frame must be long and narrow, and the adjustable stanchion so placed that the occupant can be held well back. The height of the platform is 51 inches in front, and is constructed on an incline which makes the rear 24 inches high. The stanchion is supported by 2 x 4 inch pieces attached to each side and resting upon the horizontal 2 x 4 of the frame. With a series of holes in the latter, and a hole in each of the pieces



Sill of breeding rack.

attached to the stanchion, it may be set and held at any desired length by using bolts dropped loosely in the holes.

Loose dirt or cinders at the rear of the rack, that can be filled in or dug out quickly, will be found convenient in overcoming the difficulty arising from large or small cows.—*Hoard's Dairyman*.

FATS IN FOOD.

At a recent meeting of the American Medical Association, Professor Mendel, of Yale University, presented an exceedingly interesting paper on foods and nutrition, in which he gave an account of studies made by him for the purpose of determining the food value of various commonly used fats. In experiments upon young animals, Professor Mendel found that when lard was the only fat used there was a cessation of growth and a decline in weight at the end of three months. When butter-fat was used, there was no sign whatever of failure after feeding for a year or more.

Cotton-seed oil is mentioned by Professor Mendel as belonging in the same category with lard. In the same class he placed numerous other chemical fats which have been recently offered as a substitute for butter.

The processes to which these artificial products are submitted are believed by many authorities to depreciate, if not destroy, their food value. Many facts have come to light in recent times which indicate that many of the processes employed in the preparation of food are damaging, and sometimes highly destructive. Long cooking at high temperature, for example, is now known to destroy the vitamins which play such a useful part in all our food.

MILLING AND BAKING TESTS ON ARGENTINE AND WALLA WHEATS.

(Continued from page 666.)

*By P. R. Scott, Chemist for Agriculture, and F. G. B. Winslow,
Departmental Miller.*

From the world-wide reputation of the baking quality of wheats grown in the Argentine Republic, and on the Pacific Coast of America, it would be natural to infer that flour, milled from these wheats would, on baking, return well-piled loaves of good texture and colour. Advantage was taken of testing the quality in that respect of a flour milled from a mixture of wheats recently imported. The composition of the flour was made by milling three parts Red Fife, three parts Argentine, and five parts Blue Stem and Walla.

The flour, to all appearance, possessed a fair bloom and colour, and compared favorably with our ordinary home-grown flour. On testing its water absorption power and gluten content it exhibited properties which led both of us to believe that it was lacking in quality, and hardly up to the standard requisite to insure success in turning out an average quality loaf when baked by the usual method.

Gluten is of special importance, as the power of making bread from wheat flour depends on its presence; it is therefore a characteristic constituent of wheat.

Gluten is subject to variation in quality and quantity, the strength of the flour depending, among other things, more on the quality than the quantity.

Gluten, washed from a strong flour, is generally tough and elastic; from a weak flour, soft, sticky, and lacking in cohesive power resembling soft putty. To determine the gluten content the flour is kneaded into a dough by admixture with water, a portion of the dough is taken and treated to a washing process to wash away the starch particles and leave the gluten. When so treated the dough of some flour will remain in mass, without any apparent separation of gluten particles. The dough of other flour may become pasty, and particles of the gluten may separate from the mass, and add to the difficulty of complete recovery of the gluten. This latter property was found to belong to the flour under observation. Additional evidence of the qualities of the flour may be afforded by the water absorption test. Dough made to a standard consistency will exhibit different properties when gently pulled apart between the hands. It will either show a certain amount of elasticity, enabling the operator to stretch it without breaking for varying distances, or if made from a weak flour will be lacking in elasticity, and tear or break off instead of stretching. The flour, under observation, was lacking in elasticity, and may be considered as of weak strength. The baking test will usually give a better idea of the quality of the flour for bread making than any other. The flour baked by the ordinary method was found to prove much quicker in the trough than the ordinary local flour, and when baked the loaves were of small volume and very open texture, and the colour of the crumb dark. As a result it was thought advisable to bake a number of batches varying the amount

of yeast food added, and the length of time allowed in the proving troughs. In all, six batches were treated and baked as follows:—

1. Using one-third quantity of yeast food, fairly tight dough, short proving.
2. Using one-third quantity of yeast food, fairly tight dough, long proving.
3. Using ordinary quantity of yeast food, fairly tight dough, short proving.
4. Using ordinary quantity of yeast food, fairly tight dough, fairly long proving.
5. Using ordinary quantity of yeast food, fairly tight dough, long proving.
6. Using one-third quantity of yeast food, fairly tight dough, usual time proving.

The loaves baked were afterwards measured and their colour and texture noted—20 points were allowed as a maximum for texture and colour—

Volume.	Texture.	Colour.	Remarks.
1340 ccs. ..	19 ..	17 ..	Fair crust, rather foxy.
1350	16 ..	17 ..	Crust white, rather foxy.
1355	15 ..	17 ..	Crust white, rather foxy.
1355	15 ..	17 ..	Crust fair, rather dull.
1350	16 ..	17 ..	Crust fair, dull.
1475	16 ..	17 ..	Good general appearance, fair crust.

Before passing judgment on the loaves they are allowed to stand overnight. The general appearance of the loaf is then considered, the points noted being more particularly the colour of the crust, and the freedom from cracks and roughness. The volume is then measured and the loaf cut.

A well-piled loaf should present the appearance of evenness of pores. The pores should be comparatively small, the body soft and pliable; on pressure being applied to the bread the pressed portion should immediately return to its original face. Judged accordingly, the majority of the loaves when examined were found to be of indifferent quality, lacking evenness of pores; the texture dull and sodden. Number one batch gave loaves of very fair texture, the next best was No. 6. This batch, although the loaves were found to be of poor texture, the volume and general appearance of the loaf was superior to that of the No. 1 loaf. Reduction in the amount of yeast food resulted in a more gradual fermentation and better textured bread.

Further tests were made on wheats imported into this State by the s.s. *Highbury* and s.s. *Calula*. These shipments comprised some of the wheat known as Red Life and Blue Stem. The usual chemical and baking tests were applied giving the results.

CHEMICAL AND PHYSICAL TESTS.

Milling No.	Variety.	Bushel weight.	Protein content in wheat.	Flour yield.	Strength flour.*	Gluten.		Nitrogen content in flour.	Crude protein in flour.		Colour.
						Wet.	Dry.		per cent.	per cent.	
			per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	max. 20.	
438	Calula Red Life ..	64.1	16.18	73.0	46.0	23.1	7.7	1.42	8.87	14	
439	Highbury Red Life ..	64.1	8.75	75.1	46.4	22.6	7.3	1.38	7.99	11	
440	Calula Blue Stem ..	64	10.31	71.1	43.8	18.6	6.2	1.37	8.60	14	
441	Highbury Blue Stem ..	63	8.83	72.2	44.2	17.1	5.7	1.17	7.31	14	

* Quarts of water required for 200 lbs. flour.

A marked difference is found in the protein content of these shipments, in the *Calulu* cargo both the wheats contained a higher percentage. The gluten content, however, was not so variable, but may be considered as very low, and judged by indications given during the operation of determining the gluten content the quality of the gluten would be considered as weak.

The baking test of these flours gave the following result:—

Milling No.	Variety.	Colour.	Texture.	Volume.	Water in dough.	Remarks.
		max. 20.	max. 20.	ccs.	ccs.	
438	Calulu Red Fife ..	5	10	1,345	193	Fair crust inclined to be white
439	Highbury Red Fife ..	5	10	1,340	197	Fair crust inclined to be white
440	Calulu Blue Stem ..	5	10	1,350	186	Very fair crust and appearance
441	Highbury Blue Stem ..	5	10	1,400	188	Very fair crust and appearance
	Argentine .. 33 per cent. }	7	12	1,420	190	Fair crust and appearance
	Blue Stem .. 66 per cent. }					

From the general appearance of the loaves all may be classed as of very poor quality and inferior in all respects to those obtained from the blend of flour containing Argentine. At the same time as these flours were baked, a mixture of flour, Argentine 33 per cent., and Blue Stem 66 per cent., was baked, and the result was a decided improvement in the general appearance of the loaf, the colour, texture, and volume being better in each respect. It would be advisable, therefore, to use some stronger baking flour, such as Argentine or Australian, to mix with these to obtain a flour capable of producing a loaf suitable for local requirements.

On account of the poor quality of the gluten found in former shipments of the Pacific Coast wheats, samples of flour were obtained from two representative mills. These samples were submitted to the baking test. The method of baking followed was practically similar to the general practice in common use by the Victorian baker. The straight dough process used gave satisfactory results both as regard the general appearance of the loaf and its texture and colour.

By way of experiment other batches of loaves were baked, using these flours, by trying the effect of a scald. The scald was obtained by taking approximately $3\frac{1}{2}$ per cent. of the flour and a small quantity of water, and boiling the mixture. It was then allowed to cool down to 85 degrees F., and a standard dough was prepared. The dough was afterwards kneaded in the usual way, and placed in the proving chamber, the temperature being kept constant at 80 degrees F. This batch was found to prove much quicker than an ordinary dough, but produced a loaf of decidedly superior volume and general appearance to the batch baked by the usual routine method.

For flour of similar quality the use of a scald appears to be an advantage, and, although entailing extra work, is worthy of more than passing mention, and may be recommended for an extended trial on a commercial scale.

RESULT OF BAKING TEST.

Flour.	Gluten.			Water used in making dough.	Volume of loaf.	Weight of loaf.	Colour.	Texture.	Remarks
	Wet.	Dry.							
	qts.	per cent.	per cent.	ccs.	ccs.	grams.	max. 20.	max. 20.	
1	47	21.3	7.5	200	1,550	465	16	16	Ordinary treatment given, crust foxy, fair sized loaf
	47	21.3	7.5	200	1,500	464	16	16	Fairly long proof, more yeast food, crust foxy, fair sized loaf
	47	21.3	7.5	200	1,400	481	17	17	Scald used, ordinary proof, good crust, and fair rise in oven
2	47	21.4	7.4	200	1,530	480	16	17	Ordinary treatment, crust foxy, fair sized loaf
	47	21.4	7.4	200	1,525	484	17	17	Scald used, good crust and general appearance

* Quarts of water per 20 lbs. flour.

THE WINE YIELD OF THE WORLD IN 1914.

The following table, published by the *Moniteur Vinicole*, of Bordeaux, shows the wine yield of the world in 1914:—

	Hectolitres.	Gallons.
France (including Corsica) ...	59,981,492	1,319,592,824
Algeria ...	10,317,719	226,989,818
Tunis ...	300,000	6,600,000
Italy ...	43,046,000	947,012,000
Spain ...	16,167,940	355,694,680
Russia ...	4,800,000	105,600,000
Austria-Hungary ...	4,500,000	99,000,000
Portugal ...	4,000,000	88,000,000
Azores—Canary, Madeira ...	30,000	660,000
Greece and the Islands ...	2,750,000	60,500,000
Germany ...	1,000,000	22,000,000
Turkey and Cypress ...	800,000	17,600,000
Roumania ...	661,000	14,542,000
Switzerland ...	507,000	11,154,000
Serbia ...	350,000	7,700,000
Bulgaria ...	40,000	880,000
Luxembourg ...	1,000	22,000
Argentine Republic ...	5,500,000	121,000,000
Chili ...	4,000,000	88,000,000
United States ...	1,740,000	38,280,000
Brazil ...	450,000	9,900,000
Anstralia ...	300,000	6,600,000
Uruguay ...	200,000	4,400,000
Cape of Good Hope ...	175,000	3,850,000
Peru ...	160,000	3,520,000
Bolivia ...	70,000	1,540,000
Canada ...	17,000	374,000
Mexico ...	8,500	187,000
Persia ...	2,500	55,000
Egypt ...	1,500	33,000

METHODS OF MILK RECORDING IN SCOTLAND.*

*By Alex. Lauder, D.Sc., Professor of Agriculture, East of Scotland
Agricultural College.*

Originated in 1903 by the late Mr. John Speir, of Newton. He obtained a grant of £200 from the Highland Society and made a beginning in three counties in that year.

Progress of the work:—

Year.		Number of Cows	Year.		Number of Cows.
1903	...	1,342	1909	...	9,202
1904	...	389	1910	...	9,514
1905	...	815	1911	...	13,965
1906	...	2,688	1912	...	18,356
1907	...	3,931	1913	...	22,300
1908	...	8,132	1914	...	25,000

This work is now carried on by the Scottish Milk Records Committee. This is a body consisting of representatives elected by—

1. The local Milk Record Societies.
2. The three Scottish Agricultural Colleges.
3. The Highland Agricultural Society.

The Committee receives a grant from the Development Commissioners, which amounted to £2,000 for 1914. It is hoped that this grant may be further increased next year. A grant of £40 is also received from the Ayrshire Herd Book Committee.

Local Societies.—The work of the society is carried out through local committees or societies. They consist of the dairy farmers in a district, and are of such a size as to provide work for the whole of the time of one man in the work of testing. The number of herds in each society varies from twelve to twenty-four, depending on the number of cows in each herd. In Ayrshire and Renfrewshire the average number is about thirty; in Wigton and Kirkenbright the herds are larger, averaging about fifty.

Tests for the amount of milk fat may be made every 14, 21, or 28 days, according to the number of members in each society.

A test every 21 days is found to give satisfactory results, and is the most common period in Scotland.

Tester arrives in the afternoon. Weighs and tests evening milk, and the milk the following morning; all testing and weighing is done by tester. The farmer supplies necessary details as to feeding, times of calving, &c. If the number of cows in the herd exceeds 50, the tester stays for two days.

The yield of milk is determined in pounds. Fat determined, and then the yield expressed in terms of pounds of milk of 1 per cent. fat.

* Synopsis of address presented before the British Association for the Advancement of Science, Australian meeting, Melbourne, 19th August, 1914.

This method has been adopted as the simplest method of comparing the yields of different cows on a common standard of quality.

Results.—Two copies made:—

- (1) to farmer;
- (2) to office of Central Committee.

Finance.—The annual expenses of a local society, exclusive of the Board, of the recorder, and of the cost of transference from farm to farm, may be put at about £80.

The recorder is boarded by the farmer, who generally drives him to the next farm he is visiting. In some cases, however, the recorder is provided with a horse and trap by the local society.

Grant from Central Committee.—The salary of the recorder varies from 20s. to 25s. per week, exclusive of board.

In some societies the total expenditure is simply divided amongst the members; in others the members are charged so much per cow. This comes to 1s. 9d. to 1s. 10d. per annum, and each member is charged on a minimum of 40 cows, £3 10s. to £3 13s. 4d. per annum.

The secretary of the local society is generally one of the members, and in this case is unpaid. In some cases three or four societies in the same county join together and employ a paid secretary, generally a solicitor.

The general results of the work of the societies during the comparatively short time they have been in operation have been, by the elimination of unsuitable cows, to generally increase the yield of the herds and also their value, particularly for export purposes. The improvement has, perhaps, been most marked in the large herds kept in Wigtonshire and Kirkenbright, where formerly the management was, perhaps, less personal than in Ayrshire. In the course of eight years the average yield per cow has increased in some herds by from 100 to 200 gallons.

The following record of two herds in Wigtonshire may be given as an example:—

		Herd No. 1. Average yield in gallons.		Herd No. 2. Average yield in gallons.
1907	.. .. .	496	..	527
1908	.. .. .	506	..	600
1909	.. .. .	523	..	585
1910	.. .. .	572	..	625
1911	.. .. .	617	..	657
1912	.. .. .	652	..	680
		<hr/>		<hr/>
Increase	.. .. .	156	..	153
Gallons per cow.				
= (£@ 6d. per gallon) £3 18s.				
.. .. . £3 16s. 6d.				

The increase in the value of the pedigree milk record Ayrshires for export purposes has been estimated at about 50 per cent.

Indirectly the keeping of records has had the effect of greatly stimulating the interest of the farmers in their herds, and a considerable improvement in breeding has been the result. In this connexion the importance of the sire being descended from a dam of good milking qualities has been amply proved by experiment, and cannot be too strongly insisted upon.

Classification of Cows.—

Good cows = 2,500 gallons of 1% fat.
 Good cows = 714 gallons of 3.5% fat.
 Good heifers = 2,000 gallons of 1% fat.
 Good heifers = 570 gallons of 3.5% fat.
 Bad cows = 1,660 gallons of 1% fat.
 Bad cows = 474 gallons of 3.5% fat.
 Bad heifers = 1,330 gallons of 1% fat.
 Bad heifers = 380 gallons of 3.5% fat.

Cattle Shows.—The judging of cows at cattle shows on purely or largely "fancy" points is gradually giving place to the more rational system of also taking into account the capacity of the animals as milk producers. Three classes are now commonly adopted:—

- I. For cows giving over 1,200 gallons.
- II. For cows giving over 1,000 gallons.
- III. For cows giving over 800 gallons.

Gavin's Work on the Interpretation of Milk Records (Journal R.A.S., vol. 73, p. 153; J.A. Sc., vol. V., pt. 4, p. 377 (1913); vol. 5, pt. III. (1913) p. 309).

Gavin has carried out a statistical inquiry into the records of a large number of cows; these records extended over 24 years, and were kept at Lord Rayleigh's dairy farms in Essex. In particular he has investigated two questions:—

- (1) How to define a cow's milking capability as accurately as possible by a single and unqualified figure.
- (2) On the accuracy of estimating a cow's milking capability by her first lactation yield.

(1) DEFINITION OF MILKING CAPACITY OF A COW.

Difficulty of assigning a definite numerical value to the inherent milking capacity of cows. Breeders generally rely on such figures as—

1. Total yield per calendar year.
2. Total yield per calf.
3. Average yield per week, &c.

The enormous fluctuations found in the same animal show them to be subject to a variety of outside influences. To make them of value it is necessary to enumerate in every instance the particular circumstances in which the cow in question has been placed during the period taken.

This is obviously impossible when a large number of cows have to be dealt with, and it becomes necessary to define a cow's milking capability as accurately as possible by a single unqualified figure.

Exterior Circumstances Affecting Yield.—

1. Age of Cow.
2. Number of weeks in milk.
3. Number of weeks' rest before calving.
4. Interval between calving and subsequent service.
5. Time of year of calving.
6. Food, weather, and general treatment.

Selection of Figure.—After various trials the following figures were subjected to a careful statistical examination:—

1. Average, *i.e.*, average yield per day from 5th to 12th week after calving.
 2. Maximum, *i.e.*, maximum yield of any one day.
 3. Revised maximum, *i.e.*, maximum daily yield maintained or exceeded for not less than three entries in the record-book.
- Example, four cows: 16, 16, 16-16, 17, 17-16, 18, 16-16, 17, 18 quarts.

The revised maximum is taken as the highest yield common to all three entries; thus, in all the above cases, the revised maximum is taken as 16 quarts. The result of the inquiry points to the revised maximum being the most satisfactory figure.

(2) THE ACCURACY OF ESTIMATING A COW'S MILKING CAPABILITY BY HER FIRST LACTATION YIELD.

Desirability of knowing at the earliest possible date whether a cow is worth keeping or not. How far can the milking capability of a cow be estimated from the yield she gives with her first calf. The revised maximum is used as indicating the milking capacity of the cow in each case. From an examination of the statistics available Garvin has constructed a table showing the probable milking capacity of a cow and its relation to the first lactation yield.

Summary.

Class	I.	..	..	1st Calf R.M.	Gallons.
				5- 9 quarts	604
"	II.	..	..	10-11 "	658
"	III.	..	..	12-17 "	724

Cows in Class I. should be discarded after the first calf, unless there are any extenuating circumstances. The probability is that one in five will turn out good yielders.

Class II. offers the greatest opportunity to the skilful judge of dairy cattle. It is "odds on" that they will pay for keeping, but "odds against" that they will turn out high yielders. Cows of this class should be kept for the second calf.

Class III. may be considered as likely to do well, and should, of course, be kept. At the same time, it unfortunately appears to be less certain that cows in Class III. will be good yielders than that Class I. will do badly.



THE WALNUT.

(Continued from page 687.)

C. F. Cole, Orchard Supervisor.

DISEASES.

The walnut tree, in Victoria, has practically remained free from attack by larvæ of the many different species of wood borers, which do considerable damage to indigenous, as well as introduced, trees. How long this tree will remain immune time alone will show. So far the only borer recorded found slightly attacking the bole and boughs of the walnut is a very common indigenous species known as the *Cherry Borer* (*Cryptophaga unipunctata*) (*Maroga giganteella*). Of recent years insects belonging to the coccidæ family (scale), principally introduced species, have been found attacking the tree, but so far there is no record of any scale insect causing serious injury. The walnut can, therefore, be looked upon as a tree very free from insect attack likely to cause serious trouble. But there are diseases which cause injury to the developing nuts upon the trees and the dried nuts when stored. Only those diseases considered of importance will be dealt with separately under the headings of Insect, Fungus, or Bacterial Pests, as the case may be.

INSECT DISEASES.

Acknowledgment is due to Mr. C. French, junior, State Government Entomologist, who kindly assisted me with the life history and treatment of most of the insect pests recorded hereunder:—

CHERRY BORER (*Cryptophaga unipunctata*).

The larva, when full grown, is about 2 inches in length, somewhat hairy, and of a pinkish-white colour. The perfect insect (moth) is generally a silky white colour, with a black spot upon each fore-wing, hind-wings darker margined with a white fringe, antennæ black, length of body 10-12 lines, spread of wing 20-30 lines.

This grub tunnels under the bark and destroys the sap wood and cambium layer, which is its principal food. When not feeding or disturbed it usually retires into a bore or tunnel gnawed right to the pith or heart of the bough or bole. Indication of attack is indicated by sawdust-like excrescences, at times accompanied by the exudation of gum upon the surface of the outer bark. Upon examination, very often the tunnelling beneath the bark extends right around the bough. The slightest tap upon the bark, at the place of entry, causes the grub to make a hasty retreat to the extreme depth of the bore or tunnel.

Treatment.—As soon as the working of a borer is detected, clear away the sawdust-like matter or any destroyed bark. If a bough is attached and the injury is fatal carefully saw it off and burn. Wax over any wounds made by the removal of destroyed bark or boughs.

The grub may be destroyed by injecting a little carbon bisulphide into the bore or tunnel and plugging with a piece of clay or other suitable substance, or by working into the bore a piece of pliable wire. Plugging the bore with a stick dipped into a mixture of three parts tar and one part carbolic acid will kill the grub.

SAW-TOOTHED GRAIN BEETLE (*Silvanus surinamensis*, Linn.).

An introduced insect which is often found in warehouses, shops, and other places attacking stored walnuts. This insect is of a dark reddish-brown colour, measuring about 1-10th of an inch in length. The thorax is deeply serrated, with six prominent teeth on each side. Both the larva and perfect insect feed upon dried walnuts.

Treatment.—Fumigate the walnuts with carbon bisulphide or hydrocyanic acid gas.

WALNUT MOTII (*Ephestia clutella*, Hüb.).

This moth deposits very minute oval, pearly-white eggs, singly or in clusters, upon walnuts or the meat of the nuts if exposed. The larvae eat their way through the shell, usually selecting the stem end, where the shell joins.

Colour of larva dirty brown or yellowish, head brown, body covered with very light-grey-coloured hairs. General description of female moth: Head and thorax rich reddish-brown; abdomen silver-grey, changing to a rich brown; fore-wings, one-third, near the body, straw to grey in colour; remaining two-thirds of the wings, reddish-brown, with a dark band bordering on the lighter base, *i.e.*, between the red and straw colour; another dark band is situated further back and parallel to the first; two more bands extend diagonally across the tip of the wing parallel with the inner margin of the fringe, which is dark-brownish, or dark greyish, in colour, the same as the bands.

Secondary wings, fringed; general colour, silver-grey.

This insect is fairly common in Victorian stores.

Treatment.—Fumigate with carbon bisulphide or hydrocyanic acid gas.

INDIAN MEAL MOTII (*Plodia interpunctella*).

This moth is an introduced and variable species, about the size of the codlin moth (*Carpocapsa pomonella*). The outer edges of the fore-wings have reddish-brown markings. Secondary wings, dark or light greyish in colour. The larva of this moth at times does considerable damage to stored walnuts.

Treatment.—Fumigate with carbon bisulphide or hydrocyanic acid gas.

SCALE INSECTS (*San José Scale*—*Aspidiotus perniciosus*).

This scale is one of the most difficult species to detect, owing to its small size and the closeness with which it sticks to the bark. Once this scale insect becomes established it is hard to dislodge. The writer's observations are that, when full grown, this scale varies somewhat in colour. When found attacking the walnut it is much lighter, resembling the colour of the bark, than when found upon the apple, pear, and other trees.

Description.—General colour, sooty-black, with a yellowish-brown spot in the centre; shape, round. With badly-infested trees the bark has a scurfy appearance, occasionally being pitted.

Treatment.—Spraying with prepared red spraying oil, emulsion at a strength of 1 part emulsion diluted in 25 parts of cold water, applied during the dormant period of the tree, or lime sulphur wash are the two most popular washes used for the suppressing of this scale pest.

GREEDY SCALE (*Aspidiotus rapax*).

This is a fairly common scale found attacking walnut trees.

Description.—General colour, greyish, raised, and usually very thickly-clustered together; about the size of San Jose scale.

Treatment.—The same as for San Jose.

During the earlier periods of the nut season of 1914-15, at Bright and the surrounding district, a grub, attacking the developing nuts upon the trees, was brought under my notice. Upon examination I found that the method of entering the nut by this grub was identical with that of the codlin moth larva attacking the apple and pear, *i.e.*, the grub eats in from the outside, but not a single nut was found bored at the stigma or blossom end. The shell of the nuts becoming hardened at the period of attack I found that this grub bored through the husk, close to the stem, and entered the meat or kernel, which is its object of attack, down through the soft portion at the stalk end, where the shell joins. Upon opening several nuts attacked it was found that the maturing meat was being freely eaten, and that the grub was, in size, shape, and colour, very like the larva of the codlin moth, but until the perfect insect emerges from specimens collected it would not be possible to say that it is the codlin moth larva.

Signs of Attack.—The husk, at place of entry, becomes blackish in colour, finally decaying around the stem, causing the developing nut to prematurely fall to the ground. Attacked early or before the shell hardens the nuts turn black with decay and quickly fall. The walnut differs from ordinary fruiting trees that can be conveniently sprayed, so as to combat insect and other pests. Owing to the size this tree attains it would be a difficult task to spray with arsenate of lead in the same manner as apple and pear trees are for the codlin moth. Although the attack by this grub is not of a serious nature, so far as the damage done last nut season to the walnut crop is concerned, yet, in the near future, it might cause serious loss. Practically all of the nuts attacked fall to the ground, and as a wise precaution it would be as well to rake or gather up all fallen walnuts and destroy them.

FUNGUS DISEASE.—*Root Rot, Toadstool Disease (Armillaria mellea, Vahl).*

This deadly fungus confines its attack to the roots, and that portion of the stem below the surface of the soil. The fructification of this fungus is to be observed above ground by clusters of toadstools produced around and upon the butt of the tree attacked. This fungus is an indigenous species, preying upon many forms of native trees and shrubs, and prevalent in cool, moist, timbered localities, particularly mountainous ones most suited to the growth of the walnut.

Symptoms of Attack.—The foliage becomes sickly in colour, finally falling if the attack is severe, and the terminal ends of the branches die back. Upon removal of the soil from the roots and around the butt, the black cord-like mycelial strands of the fungus are found covering the roots and other parts like a dense felt or network. If the dead or decaying bark is removed white sheets of mycelium are to be found between the affected bark and wood.

Treatment.—Any trees affected with this disease should be grubbed up and burnt upon the spot from which the tree was removed. Before re-planting, the soil for some distance around the affected spot should be thoroughly turned over and watered with 1 lb. of sulphate of iron, dissolved in 4 to 5 gallons of water, or 1 lb. of sulphate of copper (blue-stone) dissolved in 8 gallons of water. This fungus may be classified as hemi-saprophytic, *i.e.*, it lives upon dead and decaying wood as a saprophyte, and becomes purely parasitic by preying upon living tissue.

Reference is drawn to this disease in a former article on preparation of land. *Journal of Agriculture* for October, 1914, page 630.

Sunscald.—It is not unusual, in districts subject to extreme heat, to see portion of the bark upon the exposed or hot side of the trunk of walnut trees destroyed by the sun. The injured bark cracks, finally decays, and leaves a scar upon the trunk. From observations such conditions seem to be due to the want of sufficient soil moisture, there not being enough moisture to keep up a regular and active sap flow. The exposed portion becomes susceptible to sunburn, which injures the cambium and causes an exudation of sap which oxidizes when exposed to the atmosphere, the bark within the injured zone becoming blackish in colour.

Somewhat similar conditions are brought about upon the nuts when exposed to a hot sun, and the tree suffering from the want of soil moisture (see Fig. 5, *Journal of Agriculture*, August, 1914, pp. 460-1). Healthy trees growing upon suitable soil having an abundance of moisture during the hot periods seem to be free from this trouble.

(To be continued.)



STANDARD TEST COWS.

During the period fifty-four cows completed their term under the regulations. Of this number forty-two gained their certificate.

Two fresh herds have been entered for testing, viz.:—

Agricultural High School, Leongatha.—Jerseys.

Muhlebach Bros., Batesford.—Ayrshires.

Quarterly Report for Period ended 30th September, 1915.

Mrs. A. BLACK, Noorat. (Jersey.)

Completed since last report, 4. Certified, 0.

A. BOX, Hiawatha. (Jersey.)

Completed since last report, 3. Certified, 3.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Roseneath's Sylvia	3,776	9 11 14 16 11 14	273	lbs.	4,305	5.39	lbs.	lbs.	lbs.	264½
Roseneath Twylish	Not yet allotted	17 12 14 24 12 14	273	12½	3,884	5.21	292.58	175		231
Roseneath Fox's Twylish	3,775	19 12 14 26 12 14	273	13	4,059	5.35	265.43	250		302½

F. CURNICK, East Malvern. (Jersey.)

Completed since last report, 1. Certified, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Eva	3,770	19 10 14 26 10 14	273	15½	6,216½	4.78	297.26	200		338½

GEELONG HARBOR TRUST, Marshalltown. (Ayrshire.)

Completed since last report, 2. Certified, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Gipsy Maid H. of Sparrovale	2,511	25 11 14	2 12 14	273	lbs. 13½	4,918	4.40	lbs. 216.12	lbs. 175	lbs. 246½

DEPARTMENT OF AGRICULTURE, Werribee. (Red Polls.)

Completed since last report, 6. Certificated, 5.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk in Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Britannia ..	Not yet allotted	6. 10. 14	13. 10. 14	273	lbs. 16	6,889½	3.92	lbs. 268.81	200	lbs. 306½
Soudana ..	Not yet allotted	20. 11. 14	27. 11. 14	273	15½	4,707	4.40	207.17	175	236½
Laurel ..	Not yet allotted	8. 12. 14	15. 12. 14	273	13½	5,006½	4.02	201.41	175	229½
Ontario ..	Not yet allotted	18. 12. 14	25. 12. 14	273	16	4,739	4.21	199.69	175	227½
Japana ..	Not yet allotted	24. 12. 14	31. 12. 14	273	19½	6,568	3.50	229.74	200	262

A. W. JONES, Whittington. (Jersey.)

Completed since last report, 1. Certificated, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk in Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Dolly ..	3,754	10. 12. 14	17. 12. 14	273	lbs. 18	4,936½	6.24	lbs. 308.23	200	lbs. 351½

C. G. KNIGHT, Cobram. (Jersey.)

Completed since last report, 4. Certificated, 3.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk in Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Arcadia ..	1,534	28. 9. 14	4. 10. 14	273	lbs. 9	4,842½	5.49	lbs. 265.90	250	lbs. 303
Bridesmaid of Tarn-pirr	2,981	2. 10. 14	9. 10. 14	273	11	4,676	4.85	226.60	175	258½
Princess of Tarn-pirr	2,986	8. 10. 14	15. 10. 14	273	8	4,835	5.09	246.26	200	280½

C. D. LLOYD, Caulfield. (Jersey.)

Completed since last report, 3. Certificated, 3.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk in Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Brownbread ..	Not yet allotted	27. 10. 14	3. 11. 14	273	lbs. 8	5,936½	6.32	lbs. 245.70	175	lbs. 283½
Countess Twylish	928	28. 10. 14	4. 11. 14	273	21	8,150	5.24	427.50	250	457½
Queen Spark ..	2,533	5. 12. 14	12. 12. 14	273	11½	4,282½	6.71	287.19	250	327½

C. G. LYON, Heidelberg. (Jersey.)

Completed since last report, 6. Certificated, 5.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Lassie III. of Ban-yule	3,620	18. 10. 14	25. 10. 14	273	lbs. 9½	lbs. 3,980*	5.01	lbs. 190.36	lbs. 175	lbs. 227½
Lassie III. of Ban-yule	509	23. 10. 14	30. 10. 14	273	16	6,907½	5.24	366.60	250	417½
Molly III. of Ban-yule	3,624	6. 11. 14	13. 11. 14	273	8	3,790	5.59	211.85	200	241½
Lassie II.	1,136	10. 12. 14	17. 12. 14	273	25½	8,544	4.91	419.56	250	478½
Ettie IV...	3,889	16. 12. 14	23. 12. 14	273	25½	8,743	4.56	398.86	250	451½

* Allment of udder for a short period affected yield.

Miss S. L. ROBINSON, Malvern. (Jersey.)

Completed since last report, 1. Certificated, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Lotina (Imp.)	1,160	30. 9. 14	7. 10. 14	227	lbs. 5	lbs. 6,052½	5.16	lbs. 312.19	lbs. 250	lbs. 356

D. SADLER, Camperdown. (Ayrshire.)

Completed since last report, 4. Certificated, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Flick of Kilmarnock	3,091	4. 11. 14	11. 11. 14	273	lbs. 25	lbs. 7,051	3.79	lbs. 267.05	lbs. 250	lbs. 304½

C. E. WOOD, Frankston. (Jersey.)

Completed since last report, 2. Certificated, 2.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Jersey May	2,115	23. 11. 14	30. 11. 14	273	lbs. 8½	lbs. 7,136½	4.96	lbs. 353.96	lbs. 250	lbs. 403½
White Bell II.	3,728	23. 10. 14	* 1. 12. 14	273	9	3,333	5.94	198.01	175	225½

* Entry deferred one month as weights not available.

E. N. WOOD, Caulfield. (Jersey.)

Completed since last report, 1. Certified, 1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Luxury	3,725	7. 10. 14	14. 10. 14	273	lbs. 17	lbs. 8,119½	5-40	lbs. 438-83	lbs. 250	lbs. 500½

W. WOODMASON, Malvern. (Jersey.)

Completed since last report, 15. Certified, 14.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Daisy (477) ..	Not yet allotted	25. 9. 14	2. 10. 14	273	lbs. 10½	lbs. 4,690½	5-14	lbs. 241-63	lbs. 175	lbs. 275½
Banker VI. of Melrose	3,631	26. 9. 14	3. 10. 14	273	15	5,402½	5-64	304-76	200	347½
Jessie V. of Melrose	3,652	5. 10. 14	12. 10. 14	273	19½	7,919½	5-26	416-81	250	475½
Edith (462) ..	Not yet allotted	10. 10. 14	17. 10. 14	273	14	5,438	5-48	296-69	175	338½
Flower VI. of Melrose	3,641	11. 10. 14	18. 10. 14	273	13	5,274½	6-14	324-17	250	369½
Graceful Duchess ..	Not yet allotted	14. 10. 14	21. 10. 14	273	14½	4,470½	6-02	269-29	175	307
Quality VI. of Melrose	3,674	20. 10. 14	27. 10. 14	273	18	8,349½	5-73	478-44	250	545½
Mystery XII. of Melrose	3,667	21. 10. 14	28. 10. 14	273	17½	6,665½	5-28	346-48	250	395
Fuchsia (468) ..	Not yet allotted	12. 11. 14	19. 11. 14	273	16½	5,503	4-51	248-39	175	283½
Daisy V. of Melrose	3,637	20. 11. 14	27. 11. 14	273	18½	6,441	5-27	339-51	200	387
Jessie (478) ..	Not yet allotted	20. 11. 14	27. 11. 14	273	18	5,063½	5-99	303-21	175	345½
Rarity VI. of Melrose	3,675	27. 11. 14	4. 12. 14	273	18½	8,023	5-28	422-48	250	482½
Mystery XIII. of Melrose	3,668	2. 12. 14	9. 12. 14	273	16	6,044	6-46	390-72	200	445½
Chevy VIII. of Melrose	Not yet allotted	17. 12. 14	24. 12. 14	273	19	6,011	5-63	338-56	175	386



SHEEP DIPPING.

By A. W. Curlewis, Inspector under the Act.

Owing to drought conditions prevailing at the time of last shearing, and for some months subsequently, the Sheep Dipping Act was practically suspended in many parts of the State, and consequently the necessity for carrying out its provisions this season is greater than usual.

The great majority of sheep-owners fully realize this fact, and are anxious that the Act should be strictly enforced. There are very few, indeed, who will neglect ultimately to dip the sheep they intend to keep, but on the other hand many postpone dipping longer than is needful, and if opportunity occurs some sell undipped sheep in the meantime.

Others may dip those intended for sale in a careless, ineffectual manner, which is likely to mislead purchasers, and tends to nullify the effect of the Act more than failure to dip at all.

The result of this neglect on the part of those whom the Act holds responsible, *i.e.*, the owners of the sheep at shearing time, is easily apparent.

Subsequent owners frequently take it for granted that the sheep have already been properly dipped. Such sheep, having thrown off most of the vermin they were carrying when shorn, may not show signs of being infested with ticks or lice for some months later, when it is perhaps too late to dip them safely and effectually, and consequently they remain, until the following shearing, a source of contagion to clean sheep, and in this way the vermin is perpetuated.

The Chief Inspector has given instructions that the Act is to be carried out as strictly as possible, and owners who are neglectful in the respects indicated will only have themselves to blame if they are "brought to book."

It is freely conceded, by those who know best about the matter, that, on an all-round basis—taking one district with another—dipping enhances the productive value of sheep, in wool and general condition of sheep and lambs, to the extent of fully 2s. 6d. per head; and it follows that, on a moderate estimate, the value of universal dipping to the sheep-owners of this State may be set down at upwards of One million pounds (£1,000,000) per annum.

It would, therefore, be false economy to abstain from having the Sheep Dipping Act administered as thoroughly as may be, since it affords adequate protection to careful flock-owners.



FRUIT PROSPECTS FOR 1915-16.

By P. J. Carmody, Chief Orchard Supervisor.

Owing to thrips and drought the fruit crop of the past season was the worst on record in this State. In many districts noted for heavy fruit yields not more than 10 per cent. of a normal crop was gathered. In consequence the trees got a good rest, and now give promise of a record yield. Particularly is this the case with apples, as the reports of the Orchard Supervisors show.

At the beginning of the season, when peaches and apricots were flowering, there occurred two or three sharp frosts that affected the setting of some of these varieties where the orchards are situated in low-lying valleys that do not admit of air drainage. Unfortunately, also, the visitation of a severe hail-storm to the Ardmona district relieved growers of the major portion of the apricot crop, as well as seriously affecting that of the peach. However, in other parts of the State good crops of these varieties obtain, but, as Ardmona is at present the principal centre of apricot production in Victoria, it is to be feared that the demand will be more than can be supplied.

As large contracts for the supply of jam have been entered into with the military authorities in Great Britain, and further contracts are contemplated if the coming season's crops of jam-making fruits warrant, there should be no apprehension of unremunerative prices ruling at the jam factories. Every effort should be made by growers to foster and develop to the fullest extent the crops that are now apparent. This can only be accomplished by good cultivation, whereby the plant food of the soil will be rendered available for the support of the heavy yields, and by careful and constant attention to the different pests that menace the fruit.

Subjoined are the reports of the different Orchard Supervisors.

H. W. Davey, Orchard Supervisor, reports for season 1915-16—

BACCHUS MARSH DISTRICT.

Apples have set very heavily, and late blooming varieties, viz., *Romes*, *Five Crown*, and *Hoover* promise heavy settings.

Pears on the whole are light, but occasionally a tree carries a big crop.

Peaches are a failure, owing to frost.

Apricots are only a light crop, owing to frost.

Plums are light, with the exception of *Pond's Seedling*, which are heavy.

Cherries are a light crop, excepting the late varieties, *Margaret* and *Florence*, which are heavy.

RIDDELL DISTRICT.

The chief fruit grown here is the apple, and heavy settings of leading varieties are plentiful, and the prospects of the apple crop are excellent.

Pear crop, medium to heavy.

Stone fruits, owing to frost, are light.

WERRIBEE DISTRICT.

Apples have set heavy crops, but *pears* are inclined to be patchy.

Apricots and *plums*, medium to good. *Peaches*, only fair. *Almonds*, heavy.

* Prospects of fruit crop, season 1915-16, Bendigo and Northern district. S. A. Cock, Orchard Supervisor—

Bendigo	..	Lockwood Strathfieldsaye Sedgwick Huntly White Hills	Apples, heavy. Pears, heavy. Peaches, light. Apricots, medium. Plums, light. Quinces, heavy. Grapes, heavy. Almonds, medium. Figs, medium. Tomatoes, medium. Area planted not as large as previous years.
Castlemaine	..	Woodend Taradale Campbell's Creek Harcourt Sutton Grange	Apples, heavy. Pears, heavy. Peaches, light. Plums, light. Apricots, light. Gooseberries, light. Quinces, heavy. Strawberries, medium.
Swan Hill	...	Nyah Swan Hill Murrabit Kerang Coluna	Apples, heavy. Pears, heavy. Apricots, heavy. Peaches, medium. Plums, medium. Almonds, medium. Figs, medium. Grapes, heavy. Tomatoes, medium. Citrus Fruits promise heavy crop.
Echuca	...	Echuca Bamawm Nanneella Corop	Apples, heavy. Pears, heavy. Peaches, light. Apricots, heavy. Plums, medium. Figs, medium. Almonds, medium. Grapes, heavy. Tomatoes, heavy. Area planted bigger than previous years. Citrus Fruits promise heavy crop.

Prospects of fruit crop, season 1915-16, Diamond Creek district. E. Wallis, Orchard Supervisor—

The average fruit crop prospects at the following places, and their environs, are as follow:—Arthur's Creek, Diamond Creek, Doreen, Eltham, Greensborough, Kangaroo Ground, Keilor, Panton Hill, Queenstown, Research, and Whittlesea.

Apples.—Very heavy.

Apricots.—Medium. The crop at Keilor and at orchards situated on low lying land at Diamond Creek, &c., was badly affected by frost early in October

Cherries.—Medium.

Peaches.—Medium. Affected by frost, same as apricots.

Pears.—Medium to heavy.

Plums.—Medium to heavy.

Quinces.—Medium. Affected by frost.

Prospects of fruit crops, season 1915-16, in the Doncaster district.
A. A. Hammond, Orchard Supervisor—

Apples.—All varieties promise a heavy crop.

Apricots.—Medium. Not largely grown.

Cherries.—Medium to light. In Doncaster cherries have only about 35 per cent. of a normal crop. In Ringwood and Croydon districts there is a medium crop.

Peaches.—Medium to good. Peaches set a heavy crop, but owing to aphids and other causes some varieties thinned out very much.

Pears.—Medium to good. Pears are very patchy. Some orchards have a heavy crop, while in others the crop is light. On the whole, there is promise of a normal crop.

Plums.—Medium. In Doncaster plums are light to medium. There is a much better crop in Ringwood and Croydon districts.

Quinces.—Good to heavy.

Prospects of fruit crop, season 1915-16, in the Evelyn district. J. Farrell, Orchard Supervisor—

Apples.—Owing to favorable weather conditions, which obtained throughout the blooming stage, all early flowering varieties, Jonathan, Yates, &c., have set a heavy crop. Late blooming kinds, London Pippin, Rome Beauty, &c., are also setting well. Black spot is not much in evidence, and, as far as can be seen at present, there will be a heavy crop of good apples.

Pears.—Williams' Bon Chretien have set a heavy crop on the older trees, but on the young ones rather light. Vicar of Winkfield mostly medium; in some localities rather light. Howell heavy. Keiffer's Hybrid heavy where conditions favour cross-fertilization, but light where cross-pollination has not been provided for. Other kinds mostly heavy.

Plums.—All varieties set well, but in many instances frost did considerable damage to the young fruit. Taking the crop on the whole it will be fairly good.

Peaches.—Brigg's Red May and Hale's Early set a good crop, but the young fruit was considerably reduced by frost. Mid-season and late kinds medium to heavy.

Apricots.—Not extensively cultivated in the district, but a fair crop is showing on the trees.

Cherries.—Almost all varieties set a heavy crop, but this has been reduced to about 25 per cent. by frost.

Quinces.—Bloomed well, but have not set as well as usual. On the whole there is a medium crop.

Citrus.—Lemons, medium to heavy. Oranges, light to medium. Other varieties, light.

Figs.—Early crop medium.

Loquats.—Medium to light.

Passion Fruit.—Plants look well, and a good crop is anticipated.

Gooseberries.—All varieties heavy.

Currants.—Medium to heavy.

Raspberries, Loganberries, and Lawtonberries.—Owing to the absence of thrip and favorable weather there is an exceptionally good crop of these fruits.

Straubberries.—Medium to heavy.

Prospects of fruit crops, season 1915-16. Gippsland district. S. Pilloud, Orchard Supervisor—

The apple crop is very heavy at Pakenham, Officer, Beaconsfield, Bunyip, Drouin, Warragul, Yarragon, Cowwarr, Darnum, Ellenbank, Bairnsdale, Bruthen, and Garfield. The Jonathans, Yates, Rokewood, Statesman, Rymer, and other varieties have set very heavily. The Rome Beauty and Londons are in bloom; if they set there will be a heavy crop. Pears are very heavy in all these places. Apricots have a splendid crop where grown. Peaches are very heavy at Drouin, Cowwarr, Bairnsdale, and Bruthen. Plums, a good crop in all places visited. Cherries, good crop at Cowwarr; other places light. Every kind looks well and very free from disease.

• Prospects of fruit crop, season 1915-16, Goulburn Valley district. G. M. Fletcher, Orchard Supervisor—

Apricots.—Kyabram, Lancaster, Merrigum, and Tatura district.—Moor Park, light and patchy; Royals, Oullin's, good. Ardmona, failure. Shepparton, good in all varieties except Moor Park.

Peaches.—Brigg's Red May, Sued, Hale's, and High's Early Canada are light in all districts. Palmerstons, Crawfords, Muir, Elberta, and the late Clings are good all round, although Pollars are lighter than usual in some orchards.

Pears.—Josephine and Williams' set very heavily, but a great number are at present falling, and it is probable that the crop will be a little lighter than last year. Williams' in Ardmona will be medium.

Peaches and Plums.—Ardmona, light to medium. Other districts, good.

Apples.—Blossomed well, and promises heavy crop.

Figs.—Promising well.

SUMMARY.—All varieties in Ardmona were very seriously damaged by a heavy hail-storm on 12th October, which practically wiped out the apricot crop. Only the south-west corner of the settlement was missed, and these crops are very fair. A frost, a week before the hail, also helped to damage the peach crop. In the rest of the Valley all varieties promise well, except Moor Park apricots. The blossoming this spring was very heavy, and extended over a much longer period than usual. A good setting of prunes in all districts except Ardmona resulted, particularly in Angelina Burdetts.

Prospects of fruit crop, season 1915-16, Maryborough district. W. P. Chalmers, Orchard Supervisor—

ARARAT AND STAWELL.

Apples, heavy. Plums, medium. Pears—Williams' Bon Chretien, light; Napoleon, heavy; others, medium. Cherries, light. Grapes, good. Apricots, medium.

HORSHAM.

Apricots—Oullin's, medium; other varieties, light. Peaches—early varieties, good; late varieties, heavy. Plums, heavy. Pears—Williams' Bon Chretien, light; others, heavy. Apples, heavy.

AMPHITHEATRE.

Apples, heavy. Pears—Williams' Bon Chretien, light; others, medium.

DUNOLLY AND BET BET.

Apples, heavy. Apricots, medium. Plums, medium. Pears—Williams' Bon Chretien, very light; others, medium. Cherries—early, light; others, medium. Quinces, heavy. Grapes, medium. Peaches—early, medium; late, heavy.

Prospects of fruit crops, season 1915-16, Mildura district. G. H. B. Davidson, Orchard Supervisor—

Citrus.—Trees not affected with salt water showing good crops. There are a considerable number that will not bear this season through this cause; these are gradually coming round, although there is a great deal of dead wood in the trees.

Pears.—Not as heavy as last year, being patchy in setting; some with good crops and others light.

Apricots.—Heavy, both in Mildura and Merbein.

Peaches.—Like the pears, are patchy; some good crops and others light. Merbein light. Elbertas cast their buds.

Plums.—Good.

Figs.—Good.

Walnuts.—Not many grown.

Apples.—Not many grown.

Almonds.—Good.

The fruit suffered very much from a severe wind storm, many peaches and plums being blown off at Merbein; the apricots did not suffer so badly.

Prospects of fruit crops, season 1915-16, in the Mornington Peninsula.
E. Meeking, Orchard Supervisor—

Apples.—Throughout the whole of the Mornington Peninsula there promises to be a record crop of all varieties, especially Jonathans, heavier even than last season, which was the heaviest for many years. (The immunity from frosts severe enough to be harmful, which this favored district enjoys, is, I feel certain, the chief cause of the consistently good crops of fruit.)

Pears.—Being the "off" season in this district for most varieties, particularly Williams' Bon Chretien, the crop generally promises to be from fair to medium. The usually shy-bearing varieties—such as Keiffer's Hybrid, Gansell's Bergamot, Winter Nelis, Josephine de Malines—where effectively interpollinated and properly pruned, have set very well.

Apricots.—Throughout the whole district this crop promises to be particularly heavy, with the exception, perhaps, of the Oullin's Early Peach variety, fortunately not extensively grown.

Plums.—Being the "off" season, the crop is generally light, except in a few instances where interpollination has been properly carried out and scientific pruning done. In these cases the crop is normally heavy.

Cherries.—Very few grown except in the Red Hill district, where the crop is consistently heavy.

Peaches.—Grown to any extent only at Narre Warren, where the crop is from medium to heavy.

Strauberies.—Confined almost solely to Red Hill and surrounding district. The first crop (from medium to heavy) is being gathered. There is a good prospect for the succeeding crops.

SUMMARY.—Taken altogether the prospects for the present season of the fruit crop generally were never brighter, and, given a normal summer, the yield should be a record one.

Prospects of fruit crops, season 1915-16, Wangaratta and North-Eastern districts. C. F. Cole, Orchard Supervisor—

Oranges and Lemons. Heavy blooming following the drought conditions, and promise a heavy crop.

Peaches, Apricots, and Plums.—Heavy, medium to light, Yackandandah and Wangaratta districts. Peaches and plums, including prunes, promise a heavy crop.

Almonds.—Good crop.

Cherries.—Good crop.

Pears.—Medium to light in most districts.

Apples.—Medium to heavy. Light in Jonathans Yackandandah district.

Figs.—Medium to heavy.

Loquats.—Medium to light.

Quinces.—Promises to be heavy.

Strauberies.—Good.

Prospects of fruit crops, season 1915-16, Western District. A. J. McCalman, Orchard Supervisor—

GEELONG DISTRICT.

Apricots.—Set heavy crops, but about Batesford have been thinned out very much by frosts. On the whole, the crop will be good. The principal varieties are Moor Park, Turkey, Mansfield Seedling, and Hems Kirk.

Apples.—Nearly all varieties are setting heavy crops. Jonathan looking especially well. Cleopatra, Reinette de Canada, Stone Pippin, Rokewood, Dunn's Favourite (Munro), promise good yields. Rome Beauty and London Pippin show abundant bloom.

Pears.—Williams', Beurre de Capiaumont, Vicar of Winkfield, and Black Achan promise good yields. Other varieties mostly light.

Plums.—Black Diamond, Angelina Burdett, Early Orleans, and Gentleman Plum have set heavily. Some varieties are light, and damage has been done by frost in places. The crop will be fairly good.

Cherries.—Early varieties are rather light. Late varieties good.

Peaches.—These will be fairly good. Early varieties are mostly grown.

Gooseberries.—A good crop.

COLAC AND WARNCOORT DISTRICT.

Apples.—These promise an abundant crop. Rokewood, Jonathan, Sturmer, Asopus Spitzenburg, Statesman, and Rome Beauty all look well.

Pears.—Williams' are fair. Keiffer's heavy.

Apricot.—A good crop.

ROKEWOOD DISTRICT.

Apples.—Rokewood, Jonathan, Stewart's Seedling, King David, Ben Davis, Rome Beauty, and London Pippin promise heavy yields.

Pears.—Promise of a good crop. Williams', Keiffer's Hybrid, Beurre Clairgeau, and Josephine have set well.

Apricots.—Promise of a medium crop.

MOUNT COLE DISTRICT.

Apples.—Jonathan, Rokewood, Dunn's Favourite (Munro), Reinette de Canada, Stone Pippin, Sturmer, Rome Beauty, and Golden Nob promise heavy yields. Other sorts medium.

Pears.—Williams', very light. Josephine, Vicar of Winkfield, and Winter Nelis, light.

Plums.—Both dark and light coloured varieties show a medium crop.

Japanese Plums.—Very light.

Apricots.—A failure; were destroyed by frost.

Cherries.—Early sorts light. Later kinds a medium crop.

Black and Red Currants.—Light.

Raspberries.—Light.

PORTLAND DISTRICT.

Apples.—Promise of heavy yields. Jonathan, Dunn's Favourite, Gravenstein, Cleopatra, Stone Pippin, Sturmer, Stewart's Seedling, Rokewood, Rome Beauty, and Cox's Orange Pippin all promise well.

Pears.—Promise of a heavy yield. The principal varieties are Williams' Beurre Bosc, Beurre Clairgeau, Beurre de Capiaumont, Vicar of Winkfield, Black Achan, and Josephine de Malines.

Stone fruits promise heavy yields, but are not largely grown.

PANMURE DISTRICT.

Pears.—Gansell's Bergamot and Josephine de Malines did not bloom well. Williams', Beurre de Capiaumont, and Vicar of Winkfield promise well.

Apples.—All varieties are setting heavily.

Cherries.—The crop is heavy.

Apricots.—Not many grown, but heaviest crop for some years.

Peaches.—Heavy.

Gooseberries.—Heavy.

SUMMARY.—Apples, heavy. Apricots, good. Pears, fair. Cherries, good. Plums, good. Japanese Plums, light. Peaches, fair. Gooseberries, heavy.

A DISINFECTANT WHITEWASH.

The following wash is applicable for both outside and inside use. Take $\frac{1}{2}$ bushel unslaked lime, slake with boiling water, and cover to keep in steam. When cool, strain through a fine sieve. Add one peck of common salt, with enough warm water to dissolve it, 3 lbs. ground rice boiled to a thin paste and stirred in while hot, $\frac{1}{2}$ lb. Spanish whiting, and 1 lb. glue previously dissolved by soaking in cold water and then melted in a water bath. Then add 5 gallons of warm water (in which a pint of pure carbolic acid per gallon has been added, if for inside work), and allow it to stand a few days before using, well covered from dust. Before applying it, as much as possible of the old limewash should be scraped off.

THE INFLUENCE OF NITRATES ON THE DEVELOPMENT OF ROOT TUBERCLES.

By Alfred J. Ewart, D.Sc., Ph.D., Government Botanist of Victoria and Professor of Botany and Plant Physiology in the Melbourne University.

It has frequently been stated that the addition of soluble nitrates to the soil by a kind of compensatory action decreases the formation of root tubercles in Leguminosæ. In that case such plants would be obtaining their nitrogen from an expensive source of supply (nitrates) instead of from an inexpensive source, viz., the air. To test this statement, experiments were carried out with broad beans (*Vicia faba*). Six plots were used, in three of which the beans were planted in double rows 4 inches wide, as commonly used in gardens, while in the other three they were planted in single rows, so as to cover the same area of ground in each plot. The same number of beans were planted in each plot at lateral distances of 6 inches. Two of the plots received a dressing of potassium nitrate at the rate of 1 cwt. per acre. Two other plots received sodium nitrate at the rate of 95 lbs. per acre, which represented an equivalent amount of nitrate as such. The remaining two plots were the controls. The beans were harvested when flowering was over, being cut close to the ground and weighed immediately. The yields are given in the following table:—

Broad Beans yield in tons per acre.	Sodium Nitrate, 95 lbs. per acre.	Potassium Nitrate, 1 cwt. per acre.	Controls.	Totals.
Double rows	5 tons per acre	6.6 tons per acre	6.8 tons per acre	18.4 tons
Single rows	7.5 tons per acre	7.3 tons per acre	5.9 tons per acre	20.7 tons
Totals	12.5 tons per acre	13.9 tons per acre	12.7 tons per acre	—

Owing to the heavy rainfall, the double row sodium nitrate plot became somewhat water-logged, and showed delayed germination, and this is probably the chief cause for the low yield on that plot. Allowing for this, the total yields given with the double-row planting, and the single-row planting would differ very little, if at all, within the limits of error. The total yield with potassium nitrate is slightly greater than that of the control, but since it is also greater than the total with sodium nitrate, this might fairly be put down rather to the influence of the potassium than of the nitrate.

Root-tubercles were abundant on all the plots. There was no evidence of any suppression of root-tubercle formation by potassium

nitrate or by sodium nitrate in the quantities applied. The largest root-tubercle was found on a plant from the control plots, but there was no generally greater abundance, or size of the root-tubercles in the plants of the control plots as compared with the others.

Hence, although the nitrates used did not diminish appreciably the formation of root-tubercles, their use as manures in the case in question would have been highly unprofitable, the plants being able to gain all the nitrogen they required through their root tubercles and from supplies already present in the soil.

ANGORA GOATS AND MOHAIR GROWING.

The following are extracts from an article submitted by Alva L. McDonald, secretary, American Angora Goat Breeders' Association, entitled "The Importance of the Angora Goat Mohair Industry to the United States."—Editor.

The word "Mohair" is the technical name for the fleece of the Angora goat. According to George Fayette Thompson, M.S., author of the work entitled "Angora Goat Raising and Milch Goats," the word comes to us through the old French "Moherre" from the Arabic "Mukhayyar," meaning mohair cloth. It differs from the wool of sheep in that it does not have the felting properties of the latter. The felting property of wool is due to the presence of scales or epithelia, which cover the fibre in much the same manner that scales cover fish. It is the felting property of wool which distinguishes it principally from other animal fibres. Mohair is a hair proper, being devoid of scales, and so it is not successfully used alone in felt goods.

As a conservative estimate the average price for mohair is around 30 cents. per pound (15 pence), therefore the average clip per head should be from 1 to 1½ dollar (4s. 2d. to 6s. 3d.).

Mohair is used for linings, ladies' dress goods, braids of all kinds, worsted goods, alpacas, silicians, imitation furs, portiers, rugs, carpets, and novelties. Every traveller in the United States has enjoyed the comforts of a luxurious seat from mohair. The red and green plush in every railroad coach, so familiar to Americans, is made from mohair. Again, the beautiful wigs, puffs, switches, displayed in the shop windows of our leading coiffeurs, are products of the Angora. A later use for mohair has been found in the manufacture of automobile goods alone. There is one mill in the East which annually turns out mohair goods to the value of from 10 to 12 million dollars (approximately £2,000,000 to £2,500,000). This is only one, and there are some ten or twelve mills engaged almost exclusively in the manufacture of mohair goods. Angora raising can be carried on by two classes of farmers and stock growers. The first is the small farmer who has some brushy waste lands on his farm which is an utter loss to him—places where grass does not grow, consequently such lands are of no value for his cows or his sheep, brush and weeds having taken possession. It is here the Angora will prove its worth. Its natural bent is to browse, while, peculiar as it may seem, it prefers weeds to grass. Therefore a small farmer can well

afford to keep a few Angoras, if for no other purpose than to clean up these waste places. Their value in this would be worth their keep, but in addition to this, they will yield a clip of mohair worth at least 1 dollar (4s. 2d.) per head, but more likely worth 1½ dollar (6s. 3d.).

The second class is the owner of a large tract of waste lands, who can utilize Angoras by putting them on the foothills and mountainous country found in every State in the Union, their natural tendency to browse and their adaptability to mountainous or steep and rocky country opens an avenue for using these tracts for which heretofore no use has been found.

The brush and weeds which cattle overlook are the Angoras' principle article of food, consequently a remarkable change is apparent. The grass follows the Angora. This is because the Angora destroys the brush and weeds, giving an opportunity for the grass to grow. Hence it follows that when the stock growers have realized handsome profits from the sale of their mohair, they have also improved their range.

Stock-owners having awakened to this fact, have gone extensively into the Angora goat business, which accounts for the fact that they are now found in every State in the Union, and the demand for Angoras at this time is unprecedented.

The States bordering on the Atlantic coast are each represented by hundreds of small bands, where they are used for the dual purpose of clearing up the waste lands and for the growing of mohair, while the industry has shown a remarkable growth on the Pacific slope, and where it appears the growth will be still more remarkable in the future.

PASTEURIZATION OF WHEY.

For many years past it has been the custom of a large number of the cheese factories to pasteurize the whey before returning it to the milk suppliers, with the result that this by-product reached the farm in a very much better condition than formerly. It was also found that the stock to which it was fed thrived much better than upon unpasteurized whey, and the farmers were almost unanimous in the opinion that its value was increased. Moreover, when the whey was pasteurized, the surroundings of the whey tank at the factory were free from objectionable smells—everything, in fact, appeared to be in favour of a continuance of this practice.

During the last year or two, since the skimming of the whey for butter-making became more general, a number of the dairy factories has discontinued to treat whey in this manner. The reason advanced—that the whey was so reduced in value that it was not worth the expenditure for heating—is quite a mistake, and dairy companies would be acting in the best interests of the farmers if they would insist upon the whey being pasteurized.—D. COOPER, in *Journal of Agriculture*, New Zealand.

BAYONET GRASS (*Aciphylla Colensoi*).

In the July issue of the *Journal* was published (page 413) a note by Mr. Temple A. J. Smith, Chief Field Officer of the Department, on "Bayonet Grass," and its usefulness in feeding starving stock in the Benalla district.

The Chemist for Agriculture (Mr. P. R. Scott) now submits the analysis of Bayonet grass as compared with Kangaroo and Wallaby grasses. It will be seen that it compares favorably with either, and explains its value during the present drought.

ANALYSIS OF EDIBLE PORTION OF BAYONET GRASS (*Aciphylla Colensoi*). *Submitted by Temple A. J. Smith.*

The sample on analysis was found to contain—

	Original.	On Dry Basis.
Moisture	48.33%	.. .. .
Ash	2.96%	5.73%
Protein	3.29%	6.37%
Crude fibre	13.93%	26.95%
Nitrogen free extract	29.47%	57.04%
Ether extract	2.02%	3.91%

The material used for analysis was that portion of the plant commonly known as the butt, the green portion being discarded, firstly, because stock do not, as a rule, eat it; and secondly, because the sharp edges of the grass irritate the mucous membrane and lessen the process whereby the food is partly built into living tissue and partly voided, as excrement. As an analysis of a food does not convey more than the composition as determined by splitting up into its component parts, it may be as well, therefore, to compare these returns with two well-known highly nutritious native grasses, Kangaroo and Wallaby:—

	Moisture.	Ash.	Protein.	Crude Fibre.	Nitrogen Free Extract.	Ether Extract.
Bayonet ..	48.33%	2.96%	3.29%	13.93%	29.47%	2.02%
Kangaroo ..	48.30%	2.73%	2.19%	16.09%	29.34%	1.35%
Wallaby ..	56.40%	3.67%	4.63%	11.82%	21.87%	1.61%

Comparing these analyses, it may be observed that the edible portion of the Bayonet grass is very similar in composition to the coarser of the two grasses used—the Kangaroo; it may therefore be considered, for all practical purposes, to be of equal value as a food, all other things being equal. Again, from a commercial point, the value of each of these grasses may be arrived at approximately by considering the protein and ether extract, to be two and one-half times as valuable as the nitrogen free extract. The sum total of these ingredients, so calculated, will return the feed units. They are as follows:—

Bayonet.	Kangaroo.	Wallaby.
42.7	38.2	37.5

If we base our calculations of the value of this feed according to the feed unit as arrived at by analysis, the bayonet grass butt is of slightly better feeding value to both Kangaroo and Wallaby grasses; this result is interesting, and helps to account for stock thriving on this food when pressed through stress of circumstances.

As a stand-by, it evidently is of some value, in times of drought as a food for starving stock; as a plant worthy of cultivation, it does not warrant any consideration.

FIFTH VICTORIAN EGG-LAYING COMPETITION, 1915-1916.

Commenced 15th April, 1915; concluding 14th April, 1916.

CONDUCTED AT THE BURNLEY SCHOOL OF HORTICULTURE

Slx Birds. Pen No.	Breeds.	Owner.	Totals.			Position in Competition.
			15.4.15 to 14.10.15	15 10 15 to 14.11.15	Seven months.	
LIGHT BREEDS.						
Wet Mash.						
38	White Leghorns	G. McDonnell	802	167	969	1
2	"	E. A. Lawson	793	159	952	2
84	"	H. McKenzie and Son	779	172	951	3
21	"	E. B. Harris	803	136	939	4
19	"	L. G. Broadbent	786	152	938	5
42	"	W. M. Bayles	761	169	930	6
53	"	W. G. Swift	794	128	922	7
5	"	C. J. Jackson	751	155	916	8
7	"	J. J. West	774	142	916	10
9	"	Marville Poultry Farm	736	155	891	11
6	"	J. Schwabb	738	146	884	12
26	"	F. Doldissen	730	150	880	13
10	"	A. Mowatt	720	144	864	14
39	"	A. R. Tuttleby	730	130	860	15
30	"	W. M. Sewell	690	157	847	16
16	"	A. E. Silbereisen	703	152	855	17
4	"	N. Burston	713	135	848	18
44	"	R. Hay	700	144	844	19
3	"	Mrs. F. M. Oliver	717	118	835	20
23	"	J. H. Gill	681	153	834	21
11	"	Fulham Park	669	164	833	22
1	"	J. B. Bridgen	676	154	830	23
28	"	Mrs. H. Stevenson	690	138	828	25
59	"	R. Lethbridge	669	159	828	26
32	"	W. G. Osburne	674	155	829	27
50	"	F. Hodges	694	133	827	28
54	"	John Hood	683	142	825	29
13	"	W. G. Clingan	679	144	823	30
49	"	T. Hustler	663	157	820	31
18	"	Bennett and Chapman	670	146	816	32
24	"	D. Adams	688	127	815	33
25	"	Lysbeth Poultry Farm	662	148	810	34
60	(5 birds)	Giddy and Son	667	133	800	35
33	"	H. C. Brock	674	122	796	37
15	(5 birds)	A. W. Hall	647	132	779	38
55	"	H. N. H. Mirams	634	140	774	39
20	"	W. N. O'Millane	633	142	775	40
43	"	R. W. Pope	615	157	772	41
27	"	C. J. Beatty	627	134	761	42
43	"	J. A. Stahl	606	154	760	43
47	"	H. I. Merrick	603	153	756	44
58	"	J. C. Armstrong	606	150	756	45
12	"	Thirkell and Smith	588	154	742	46
22	"	G. Hayman	591	141	732	47
36	"	S. Inscumb	580	149	729	48
41	"	Weldon Poultry Yards	573	156	729	49
45	"	J. A. Donaldson	579	142	721	50
46	"	South Van Yean Poultry Farm	574	139	713	51
52	"	R. Berry	577	134	711	52
57	"	A. A. Sandland	589	119	708	53
40	"	B. Mitchell	589	118	707	54
87	"	C. C. Dunn	560	131	691	55
14	"	A. Ross	525	128	653	56
56	"	W. Flood	495	137	632	57
81	(5 birds)	G. Hurst	479	114	593	58
	"	L. McLean	455	129	584	59
Total			37,103	8,044	45,147	

FIFTH VICTORIAN EGG-LAYING COMPETITION, 1915-16—continued.

Six Birds. Pen No.	Breeds.	Owner.	Totals.			Position in Competi- tion.
			15.4.15 to 14.10.15	15 10 15 to 14.11.15	Seven months.	
LIGHT BREEDS.						
DRY MASH.						
80	White Leghorns ..	W. H. Robbins ..	865	148	1,013	1
68	" ..	H. McKenzie and Son ..	740	160	900	2
79	" ..	Lysbeth Poultry Farm ..	692	153	845	3
64	" ..	W. M. Bayles ..	697	142	839	4
69	" ..	E. MacBrown ..	693	144	837	5
66	" ..	E. A. Lawson ..	666	149	815	6
63	" ..	A. H. Padman ..	662	152	814	7
76	" ..	A. A. Sandland ..	652	161	813	8
78	" ..	H. Hanbury ..	687	124	811	9
72	" ..	Mrs. E. Zimmermann ..	661	129	790	10
62	" ..	Beuweren Egg Farm ..	623	166	789	11
61	" ..	Mrs. H. Stevenson ..	622	162	784	12
65	" ..	Thirkell and Smith ..	619	151	770	13
67	" ..	C. C. Dunn ..	595	151	746	14
71	" ..	Moritz Bros. ..	562	153	715	15
73	" ..	C. L. Lindrea ..	593	168	671	16
77	" ..	South Van Veen Poultry Farm ..	509	144	653	17
74	" ..	J. H. Gill ..	464	123	587	18
75	" (5 birds)	Fulham Park ..	451	113	564	19
		Total ..	11,963	2,793	14,756	
HEAVY BREEDS.						
WET MASH.						
86	Black Orpingtons ..	C. E. Graham ..	801	140	941	1
97	" ..	Marville Poultry Farm ..	805	114	919	2
81	" ..	Mrs. T. W. Pearce ..	769	107	876	3
100	" (5 birds)	J. H. Wright ..	776	93	869	4
83	" ..	H. H. Punap ..	715	141	856	5
89	Rhode Island Reds ..	E. W. Hippe ..	663	139	802	6
93	Black Orpingtons ..	L. W. Parker ..	685	137	822	7
85	" ..	J. McAllan ..	690	127	817	8
90	" (5 birds)	Oaklands Poultry Farm ..	688	99	787	9
87	" ..	W. C. Spencer ..	641	138	779	10
91	" ..	A. Greenhagh ..	636	137	773	11
92	" ..	J. Ogden ..	609	158	767	12
99	" ..	L. McLean ..	644	129	764	13
84	" ..	Cowan Bros. ..	614	135	749	14
94	" (5 birds)	D. Fisher ..	663	78	741	15
95	Silver Wyandottes ..	W. H. Forsyth ..	583	106	689	16
98	Faverolles ..	K. Courtenay ..	510	142	652	17
83	Black Orpingtons ..	G. Mayberry ..	510	140	650	18
96	White Orpingtons ..	Stranks Bros. ..	510	96	606	19
82	White Wyandottes ..	J. B. Bridgen ..	342	118	460	20
		Total ..	12,884	2,355	15,239	

Report for the month ending 14th November, 1915.

The weather conditions for the month were very changeable. There was much heavy wind. Temperatures ranged from 42 degrees F. to 93 degrees F. in the shade. The health of the birds was good. Broodies were very plentiful. The egg yield for the month was good. The rainfall was 230 points.

A. HART,
Chief Poultry Expert.

Department of Agriculture,
Melbourne, Victoria.

ORCHARD AND GARDEN NOTES.

F. E. Pescott, F.L.S., Principal, School of Horticulture, Burnley.

The Orchard.

CARE OF YOUNG TREES.

The care of the young tree at this season of the year is one of the most important of orchard operations. A very considerable number of young trees have been planted out during the past planting season, and it is thought advisable to draw attention to this. Whatever care and attention are given to young trees will be amply repaid to the grower in after years, owing to the vigour, sturdiness, and other qualities imparted to them. It is a mistake to plant a young orchard, and, after cutting back the trees, to leave them practically to their own devices, other than following the usual methods of soil cultivation.

The trees, after the early summer cultivation and cleaning of the soil, should be mulched with straw, grass, or leafage of some description. This mulching should not be crowded around the stem, its object being mainly to create moist and cool soil conditions, and to encourage a free root establishment. The mulch material should be occasionally stirred, and no weed or grass growth should be allowed to accumulate amongst it. Where mulching material is not available, a very frequent earth mulch should be given, by constantly stirring the soil within a few feet of the trees. In addition to mulching, it will be beneficial to spray the young trees with water wherever possible, particularly on hot and windy days. At such times, the transpiration of moisture from the foliage is very excessive and continuous, and a water spray is thus very helpful to the young trees.

Further, all unnecessary buds should be rubbed off, particularly on the main trunk; and all growths in the centre should be pinched back, so as to force as much sap as possible into the growths which will ultimately form the framework of the tree. Similar attention should also be given to grafted trees: although they may not need mulching to the extent that the young trees do, yet the water syringings and disbudding work will be of great benefit to them.

CULTIVATION.

All orchard soils should be kept well worked during the summer months. It is very essential that these should have an abundant supply of moisture during the whole of the growing season. The transpiration from fruit and foliage is considerable at any time, but during hot and windy weather the amount of moisture which is required by a tree, and which is ultimately transpired from the tree, is very exceptional.

Excessive transpiration is often the cause of loss of young trees and of new grafts. They are found to part with a large amount of moisture, and are not able to retain or obtain sufficient for their nourishment: they then very soon wither and die. The soil around these should be kept well stirred; they should also be given a good straw or grass mulching, and an occasional overhead sprinkling will greatly benefit them.

The planting out of citrus trees may be continued, sheltering the tender plants from winds with hessian or breaks of scrub.

The general aims in summer cultivation should be to keep up a good loose earth mulch during the whole season, and to keep down all the weeds and useless orchard growths.

PRUNING.

Summer pruning may now be commenced, particularly on apple, pear, and plum trees. The removal or reduction of surplus leader growths, the shortening of unduly long laterals, and the thinning out of crowded shoots, will all tend to strengthen other parts of the tree, and to increase the development of new fruit buds.

SPRAYING.

Spraying with arsenate of lead for various pests will now be receiving attention. These include the codlin moth, cherry slug, root borer, looper caterpillar and various leaf-eating insects.

Cherry trees should be watched for visitations of the pear and cherry slug. As soon as this insect appears, the trees should be sprayed with hellebore or tobacco water. If there is no fruit on the trees, arsenate of lead should be used as a spray. The slug should not be allowed to defoliate the tree after the fruit has been picked. Loss of leaves at any season is weakening and injurious to the trees.

Vegetable Garden.

All weeds must be hoed out from the beds, and if these are at all abundant, they may be dug in as green manure, or they may be used for mulching the tomato, melon, marrow, or such plants. Tomato plants should be staked, and all lateral growths pinched out; they should now be well manured and well watered. If not manured, a good liquid watering once a week with liquid manure is necessary.

Asparagus beds should be allowed to mature their growths, and all cutting should now cease. A top dressing of manure will be helpful to the crowns.

Potato and onion beds will require constant hoeing, and it may be helpful to break down the tops of the onions, so as to prevent a too vigorous growth of the top, for the formation of flower buds, and thus strengthen and increase the value of the bulbs.

The long runners and weak lateral growths of plants of the melon family should be pinched back, and liberal supplies of water should be given.

French beans, peas, lettuce, cabbage, cauliflower, &c., should now be sown, the beds being made moist and cool for the planting.

Flower Garden.

Plant out dahlias this month; tubers early, and plants grown from cuttings for exhibition blooms later in the month. Water the soil well at planting, and keep well cultivated afterwards.

Rose bushes and beds may be given a good mulch with light stable manure, straw, grass, or lawn clippings. The beds should be kept rather dry, so as to allow the plants rest before the autumn period of growth.

Sow seeds of cosmos, asters, zinnia, balsams, cockscomb, and other late summer and autumn blooming annuals.

Cut down delphiniums that have yielded their first crop of flowers, so as to allow a succession of flowers to come.

Daffodil, hyacinth, tulip, ranunculus, anemone, and other bulbs and tubers may be taken up and stored; while gladioli corms may still be planted.

The garden must be kept well watered and well cultivated, so as to tide the plants over the hot and dry season.



Sugar Beet grown last season in the Maffra district, weight 28 lbs.

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The Index of Vol. XIII. will be supplied with the first number of Vol. XIV., viz., 10th January, 1916.

REMINDERS FOR JANUARY.**Live Stock.**

HORSES.—*Stabled.*—Over-stimulating and fattening foods should be restricted. Water should be allowed at frequent intervals. Rub down on coming into stables in an overheated condition. Supply a ration of greenstuff, where possible, to all horses. *Brood mares* should be well fed on succulent food if available; otherwise, oats and bran should be given. *Foals* may with advantage be given oats to the extent of 1 lb. for each month of age daily. Provision should be made for shade shelter for paddocked horses.

CATTLE.—Provide succulent fodder and plenty of clean water and shade. Provide "lick" in trough, consisting of salt 20 lbs., bone meal 20 lbs., and sulphate of iron $\frac{1}{2}$ lb. Linewash the cow bails, it helps to keep down flies. Provide calves, if possible, with good grass run, or lucerne hay or oats in a trough.

PIGS.—Supply short bedding in warm, well-ventilated styres. Keep styres clean and dry, and feeding troughs clean and wholesome. Sows may now be turned into grass run. Sows suckling young should be well fed to enable them to produce plenty of milk. Give young pigs pollard and skim milk in separate trough as soon as they will take it, and keep them fattening from the start to get them off as early as possible. Give a tablespoonful of bone meal per 100 lbs. live weight in food daily. If pigs are lousy, dress with kerosene emulsion or sulphur and lard, rubbing well into crevices of skin, and disinfect styres. Pig breeding and feeding should be very profitable for a long time to come, and it should be safe to launch out now. Plenty of water should be available for them to wallow in in hot weather.

SHEEP.—Ewes will come in season this year well to time. Merino and fine Comebacks, November and December. Crossbreds, January and February. Pure British breeds, March. Have ample rams running with them. Make sure of every ewe possible being in lamb. Two-tooth ewes, if well grown, can be bred from, but they should be well treated throughout. Use rams with width and substance, and never inferior fleeced ones. Rams work best at night, and with large paddocks it may be necessary to yard occasionally, in any case, in a season like this, yarding will help to keep ewes from excessive condition. Unhealthy discharge from sheep attracts flies, a purgative drench or pills should be used in such cases.

POULTRY.—Separate the sexes; the cockerels should now be fattened and marketed. Grade the young stock according to age and size, otherwise the younger birds will not thrive. Avoid overcrowding. Do not force pullets too much with animal food; build them up with a good variety of food, but avoid maize, and give but little meat. Increase the green food; thoroughly spray houses and perches with an emulsion of kerosene and soapsuds, or a solution of carbolic acid 1 in 60. Keep water vessels in shady spot, and renew water twice daily. Moisten dust bath.

Cultivation.

FARM.—Get all crops harvested and stacked as soon as possible. Horse-hoe maize, potatoes and other summer crops. See to insurance of stacks of grain and hay.

ORCHARD.—Keep the soil well scarified and weed free. Cultivate after irrigation or rain. Do not allow the surface to become caked. Spray against codlin moth, pear slug, vine caterpillar, and woolly aphis. Summer prune strong growing shoots and laterals.

VEGETABLE GARDEN.—Plant out all seedlings, when ready, from former sowings. Stir and mulch the surface. Dig each plot as it becomes vacant. Sow seeds of cauliflower, cabbage, peas, French beans, Kohl Rabbie, &c.

FLOWER GARDEN.—Keep the soil moist and cool by watering, hoeing, and mulching. Stake tender and lengthy plants. Water and shade young plants. Sow pansy, Iceland poppy, cosmos, aster, &c.

VINEYARD.—Summer butt or *Vena* grafting may be practised in January, though February is the usual month. This is the slackest month in un-irrigated vineyards—all ordinary work should be completed before Christmas. It is only exceptional operations, such as scurifying after rain or sulphuring in case of odium, that must be carried out. In irrigated vineyards the application of water, and the cultivation it necessitates, require attention.

Cellar.—Fill up regularly and keep cellar as cool as possible. Towards end of month commence to make preparations for the coming vintage.

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